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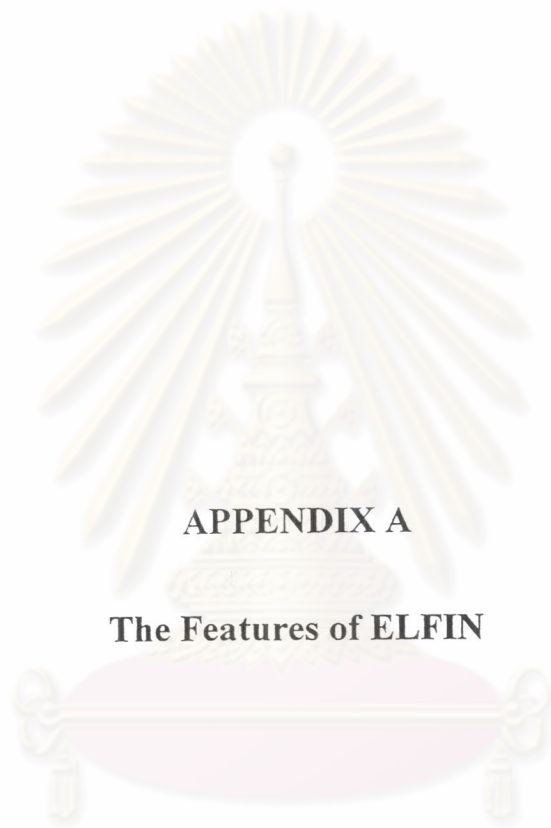


ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



APPENDICES

ศูนย์วิทยทรัพยากร
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APPENDIX A

The Features of ELFIN

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1. Features of ELFIN

ELFIN is a powerful tool to simulate the 3D electric phenomena. It is strong in evaluating the physical quantities, such as the electric moment in material, electric field in space, electric force and Maxwell's stress. ELFIN is based on a new method developed by ELF Corporation

- Integral Element Method (IEM)
- The Nonlinear Calculation

for considering the nonlinear properties of materials. As a result, even if the system to be analyzed contains nonlinear materials, ELFIN completes calculation without difficulty. Thanks to these features, ELFIN can widely apply for designing the capacitors, electron guns, electron microscopes, particle accelerators, power transmission systems, etc. Moreover, you can analyze the models in various sizes from the microscopic scale to the celestial scale.

1.1 Integral Element Method (IEM)

IEM is a method based on Maxwell's equations in integral form, and does not require the space mesh, boundary condition and gauge condition. It enables to obtain without ambiguity the electric field and force at any point in space including infinity from the fundamental laws in electromagnetics, such as Coulomb's law and the Biot-Savart law. IEM is a hybrid method of the following conventional methods:

- Moment method
- Surface charge method
- Surface current method Equivalent network method

Although each method has some faults, IEM succeeded in overcoming their weak points by combining them with one another and by appending original improvements.

Consequently, IEM achieves the fast and accurate calculation that any conventional method has not been able to accomplish up to now. Especially, it is remarkable that the reliability of results is sufficiently high even for a simplified model composed of a small number of elements.

1.2 The Nonlinear Calculation

If the polarization P (hence also the field D) of a certain material is not a linear function of the field E , it is said that the dielectric property of this material is nonlinear. When a material has the nonlinear dielectric property, there occurs a peculiar phenomenon called dielectricsaturation, in which P comes to grow up more gradually against the increasing of E or finally stop the growth. To analyze a system containing nonlinear materials, ELFIN uses the routine of iteration named the nonlinear calculation.

2. I/O Files

During calculation, ELFIN handles many I/O files classified as follows:

- Input Files (*.meg, *.mai)
- Output Files (*.mao, *.mag)
- Preservation Files (*.mat, *.maf)

The input files and output files are of text format that you can view and edit directly with a text editor, while the preservation files are of binary format. Also, the I/O files are often referred to by those filename extensions.

3. Procedures in Analysis

Analytical process in ELFIN consists of a sequence of the following procedures:

- The procedure for getting the problem name
- The procedure for reading the input files MAI and MEG
- The procedure for constructing the coefficient matrix
- The procedure for optimizing the moment-configuration
- One or more procedures for evaluating the electric field or electric force

Also, to save the time required in calculation, you can take

- Shortcut Calculations

3.1 Constructing the Coefficient Matrix

In ELFIN, the surface charge densities are treated as variables, and a set of determination equations of these variables can be expressed schematically in the following matrix form:

$$X[\Gamma V + E_0] = V \quad \dots\dots\dots (A-1)$$

where

X : Material property matrix (composed of the material data on materials)

Γ : Coefficient matrix (composed of the coefficients of spatial correlation between variables)

V : Moment-configuration vector (composed of variables)

E_0 : Bare-field vector (composed of the bare field caused from fixed charges)

In this procedure, ELFIN constructs the coefficient matrix Γ on the basis of the data on material elements obtained from MEG.

3.2 Determining the Moment-Configuration

After constructing the coefficient matrix Γ , ELFIN builds the material property matrix X according to the material data obtained from MAI. Then, it solves Eq.(1) to determine the optimized moment-configuration V . When the model contains only the materials with linear D - E property (this is the case in which X does not depend on V), it is enough to determine only V . On the contrary, when the model contains the materials with nonlinear D - E property (this is the case in which X depends on V), it is necessary to determine the vector V and the matrix X simultaneously by the nonlinear calculation.

3.3 Evaluating the Electric Field

ELFIN evaluates the electric field on the basis of Coulomb's law:

3.3.1 Coulomb's Law

In the medium with permittivity ϵ , the electric field E at a point R_p due to a charge Q at R is given by

$$E(R_p) = \frac{1}{4\pi\epsilon} \cdot \frac{Q}{|R_p - R|^2} \cdot \frac{R_p - R}{|R_p - R|}$$

.....(A-2)

Similarly, the electric field E at a point R_p due to a surface charge density (R) on an element is given by

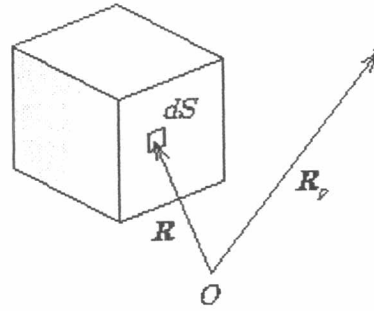


Figure A-1 the electric field E at a point R_p due to a surface charge density (R) on an element

$$\begin{aligned}
 E(R_p) &= \frac{1}{4\pi\epsilon} \iint_{\substack{\text{element} \\ \text{surface}}} \frac{dS \sigma(R)}{|R_p - R|^2} \cdot \frac{R_p - R}{|R_p - R|} \\
 &\cong \frac{1}{4\pi\epsilon} \sum_k \sigma_k \iint_{\substack{k\text{-th} \\ \text{charged} \\ \text{surface}}} \frac{dS}{|R_p - R|^2} \cdot \frac{R_p - R}{|R_p - R|}
 \end{aligned}
 \dots\dots\dots(A-3)$$

where dS is an infinitesimal surface at R on the element, and it is assumed that each charged surface has the constant, or R -independent, charge density. In this procedure, ELFIN evaluates also the electric potential Φ at R_p from the relation

$$\phi(R_p) \cong \frac{1}{4\pi\epsilon} \sum_k \sigma_k \iint_{\substack{k\text{-th} \\ \text{charged} \\ \text{surface}}} \frac{dS}{|R_p - R|}
 \dots\dots\dots(A-4)$$

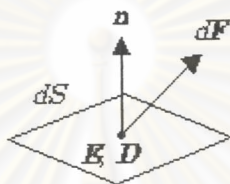
As easily seen, once we get the proper charge distribution, we can obtain the field and potential from Eqs. (A-2)-(A-4) without ambiguity. In other words, to evaluate the electric field precisely, it is essential to determine the optimized distribution of charges.

3.4 Evaluating the Electric Force

ELFIN evaluates the electric force in terms of Maxwell's stress:

3.4.1 Maxwell's Stress

If the fields E and D at a point r are known, the electric stress dF on an infinitesimal surface dS at r is given by



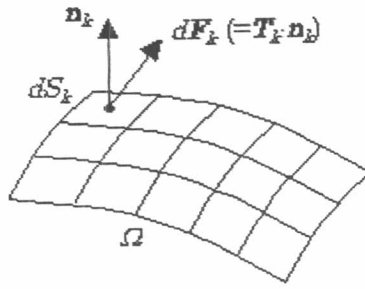
FigureA-2 the fields E and D at a point r are known, the electric stress dF on an infinitesimal surface dS at r

$$dF = dS T \cdot n \tag{A-5}$$

where T is Maxwell's stress tensor and n is the normal vector of dS with unit length:

$$T = \begin{bmatrix} E_x D_x - E \cdot D / 2 & E_x D_y & E_x D_z \\ E_y D_x & E_y D_y - E \cdot D / 2 & E_y D_z \\ E_z D_x & E_z D_y & E_z D_z - E \cdot D / 2 \end{bmatrix}, \quad n = \begin{bmatrix} n_x \\ n_y \\ n_z \end{bmatrix} \quad (|n| = 1) \tag{A-6}$$

From Eqs. (A-5) and (A-6), we can obtain the magnitude of dF along n as



FigureA-3 the magnitude of $d\mathbf{F}$ along \mathbf{n} on the surface Ω

$$|d\mathbf{F}| = \frac{dS}{2} (\mathbf{E} \cdot \mathbf{D}) \dots\dots\dots(\text{A-7})$$

Also, the total force \mathbf{F} on the surface Ω is given by

$$\mathbf{F} = \iint_{\Omega} dS \mathbf{T} \cdot \mathbf{n} \cong \sum_k dS_k \mathbf{T}_k \cdot \mathbf{n}_k \dots\dots\dots(\text{A-8})$$

where dS_k and \mathbf{n}_k are the area and the normal vector of a segment on Ω , respectively. Here, the fields \mathbf{E} and \mathbf{D} are assumed to be constant on the segment, and the tensor \mathbf{T}_k is obtained from the fields at the center of the segment.

As easily seen, once we get the fields \mathbf{E} and \mathbf{D} , we can obtain the electric force from Eq. (A-8) without ambiguity. In other words, to evaluate the electric force precisely, it is essential to get the accurate electric field, which is brought from the proper charge distribution.

4. Geometry Models in ELFIN

ELFIN does not need the space mesh, boundary condition and gauge condition unlike the conventional methods such as FEM. You are free of the annoying operations on designing geometry. The point on which you should mainly concentrate is:

4.1 Elements and Nodes

A geometry model is composed of 1 or more elements; an element consists of 1 or more nodes. The elements in ELFIN are grouped into 2 types:

4.1.1 Material elements

The elements with the source of electric field such as the electric moment and surface charge

4.1.2 Space elements

The elements at which the electric field is evaluated.

Every element is identified by the index named Element ID (EID), and its material property is fixed through the index named Material ID (MID). You can specify an element by either of EID or MID, and any 2 elements with different EIDs are definitely distinguished from each other. Corresponding to the above classification of elements, the nodes also are categorized as follows:

4.1.2.1 Material nodes

The nodes able to become vertexes of material elements.

4.1.2.2 Space nodes

The nodes able to become vertexes of space elements.

Every node is identified by the index named Node ID (NID), and any 2 nodes with different NIDs are definitely distinguished from each other. Material nodes and space nodes are quite different in the role, so that you should use them properly according to the purpose. Namely, you have to use only material nodes for creating material elements, and only space nodes for creating space elements. Also, even if they happen to have the same NID, a material node and a space node are never confused owing to the strict distinction between them.

4.2 Improving Geometry Models

In ELFIN, it is important to design a model with speculating the charge distribution. However, it is not so easy to imagine clearly such distribution before calculation. Thus, as the 1st step in a series of calculations, you had better try an analysis anyway to see the rough pattern of field lines even if the model might be incomplete. If the result of the electric field/force drastically changes between the neighboring elements, it suggests that the model does not properly reflect the distribution of physical quantities in the region occupied by these elements. In such a case, obeying the above-mentioned criteria, re-model that region and make an analysis again.

5. Input Files (*.meg, *.mai)

5.1 Geometry Files (*.meg)

In geometry files, MEG, a reserved word consisting of 4 characters leads a data-line. This reserved word is named the "header", and indicates the type of the node/element created by that line. (Headers of elements are tabulated in Table 1 on the next page.) The data-lines in MEG are classified into the following 2 types

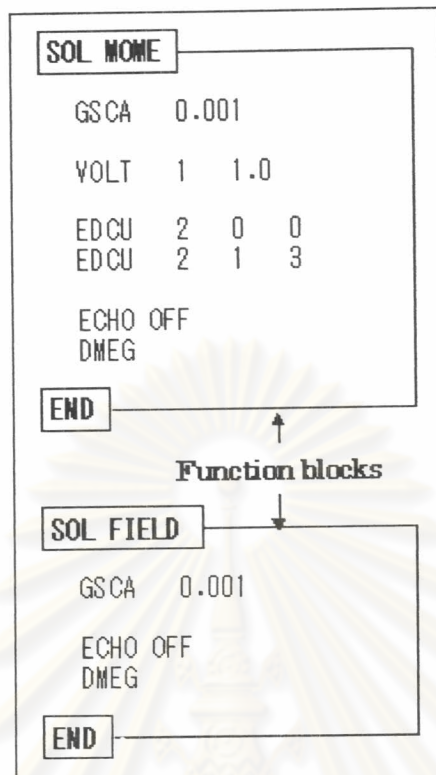
HEADER NID GID X Y Z (For defining a node)

HEADER EID MID N1 N2 ... (For defining an element)

5.2 Control Files (*.mai)

Control files, MAI, contain the following data-lines:

- Data-lines to control the analytical process.
- Data-lines to set material properties.
- Data-lines to give the additional information about model's geometry.



FigureA-4 Schematic of Control Files (*.mai)

and its typical contents are in right. In MAI, you have to insert a data-line in a block (named the **function block**) that begins at the line **SOL ***** (***: name of the function block) and ends at the line **END**. At this time, it is necessary to put a data-line into the corresponding block according to the purpose. (For the correspondence between function blocks and data-lines. The data-lines placed outside of function blocks are all regarded as the comment lines. Also, you can skip a function block entirely by making its beginning line the comment line like "*** SOL *****".

6. Output Files (*.mao, *.mag)

ELFIN generates some files to store the calculation result. Among them, the following output files are useful to check and visualize the result. They are of text format, and you can view their contents directly with a text editor.

6.1 Output List Files (*.mao)

By referring MAO, you can find out whether the analysis has been completed successfully or quitted in failure. The typical contents of MAO are as follows:

6.1.1 Restrictions in Calculation

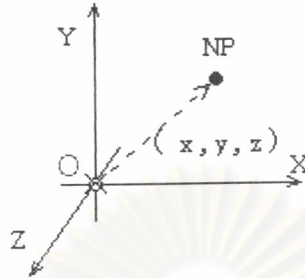
Such quantities as the total amount of memory allocatable to ELFIN, the disk size for virtual memory, and the maximum ID numbers of the treatable nodes and elements closely depend on the module of ELFIN that you use. These restrictions are enumerated at the beginning of MAO:

7. ELF/MESH

ELF/MAGIC uses MEG file as a geometry data file. ELF/MESH is an interpreter to make a geometry file (*.meg). The input file of ELF/MESH is MEI. The output files of ELF/MESH are MEG and MEO. ELF/MESH reads and executes data lines in MEI one after another. Special data lines such as R lines set the mode of ELF/MESH. ELF/MESH has the following modes:

- Loop mode (Refer to R line)
- Comment mode (Refer to "--" line)
- Axis mode (Refer to AXIS line)

7.1 G30 NP x y z



FigureA-4 Coordinates of the node

- NP: Node ID.
- x, y, z: Coordinates of the node.
- G30 creates a node on the coordinates (x,y,z).

7.2 FL0 N1 N2 N r

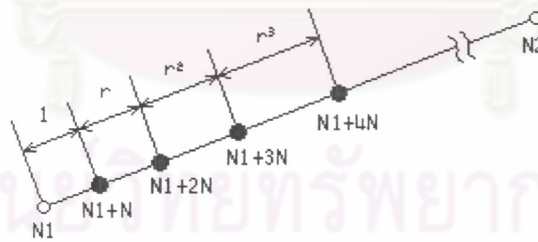


Figure A-5 a series of nodes between two already defined nodes

- **N1, N2: Node ID of the already defined node.**
- **N: Absolute value of increment of Node ID.**
- **r: Ratio of division.**

FL0 creates a series of nodes between two already defined nodes ($NID=N1,N2$). FL0 can subdivide the line segment $N1-N2$ in geometric series. The number of created nodes (n) is the maximum integer which satisfies the following inequality.

7.3 R function

- R line makes the mode of ELF/MESH either of the following:
- R: Non-loop mode,
- R(N1): Single-loop mode,
- R(N1/N2): Double-loop mode,
- R(N1/N2/N3): Triple-loop mode.

ELF/MESH repeatedly executes the data lines following the R line. Write the iteration counts in the argument of R line. Write the increment of each parameter in the data lines.

7.3.1 R Non-loop

R without arguments starts non-loop mode of ELF/MESH. Use it to terminate the preceding loop mode.

7.3.2 R(N1) Single-loop

R(N1) starts single-loop mode of ELF/MESH.

7.3.3 R(N1/N2) Double-loop

R(N1/N2) starts double-loop mode of ELF/MESH.

7.4 E10 MID N1

- MID: Material ID.
- N1: Node ID of the already defined node.

- E10 defines a point element for a 3-D model and a loop element for an axisymmetric model.

7.5 E20 MID N1 N2

- MID: Material ID.
- N1,N2: Node ID of the already defined node.
- E20 defines a line element for a 3-D model and a surface element for a axisymmetric model.

7.6 CG NS NE

- NS: Minimum Node ID.
- NE: Maximum Node ID.
- CG clears the data concerning the nodes (NID=NS~NE) in memory.

Use CG after making the material nodes, and you can reuse NIDs for space nodes.

7.7 CG NS NE

- NS: Minimum Node ID.
- NE: Maximum Node ID.
- CG clears the data concerning the nodes (NID=NS~NE) in memory.

Use CG after making the material nodes, and you can reuse NIDs for space nodes.

7.8 OG NS NE MF

- NS: Minimum Node ID.
- NE: Maximum Node ID.
- MF: Either "MGR1" or "MGR2" (for ELF/MAGIC).

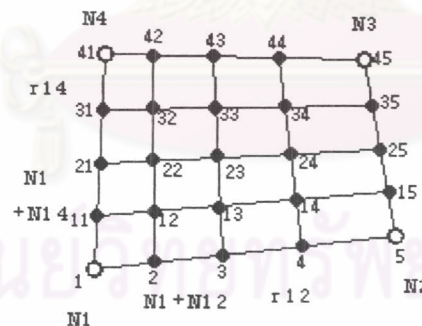
- OG defines the type of nodes and outputs the node data into MEG or MEO.

Only MGR1 or MGR2 is available as the header for a line defining a node. OG outputs the node data into MEO when you omit MF.

7.9 OE NS NE NAME

- NS: Minimum Element ID.
- NE: Maximum Element ID.
- NAME: Element name.
- OE defines the type of elements and outputs the element data into MEG or MEO. Specify the first three characters (without the number of nodes) of the element header for NAME. The number of nodes which belong to the element is automatically given. OE outputs the element data into MEO when you omit NAME

7.10 FB0 N1 N2 N3 N4 N12 N14 r12 r14



FigureA-6 FB0 1 5 45 41 1 10 1.2 1

- N1,N2,N3,N4: Node ID of the already defined node.
- N12: Increment of Node ID in the direction from node N1 to node N2.
- N14: Increment of Node ID in the direction from node N1 to node N4.

- r_{12} : Ratio of division in the direction from node N_1 to node N_2 .
- r_{14} : Ratio of division in the direction from node N_1 to node N_4 .
- FB_0 creates a 2-D array of nodes on the quadrangle composed of four already defined nodes ($NID=N_1,N_2,N_3,N_4$).

The node ID of the node on the corner must satisfy the following equations:

$$- N_2 = N_1 + (m-1) * N_{12},$$

$$- N_4 = N_1 * (n-1) * N_{14},$$

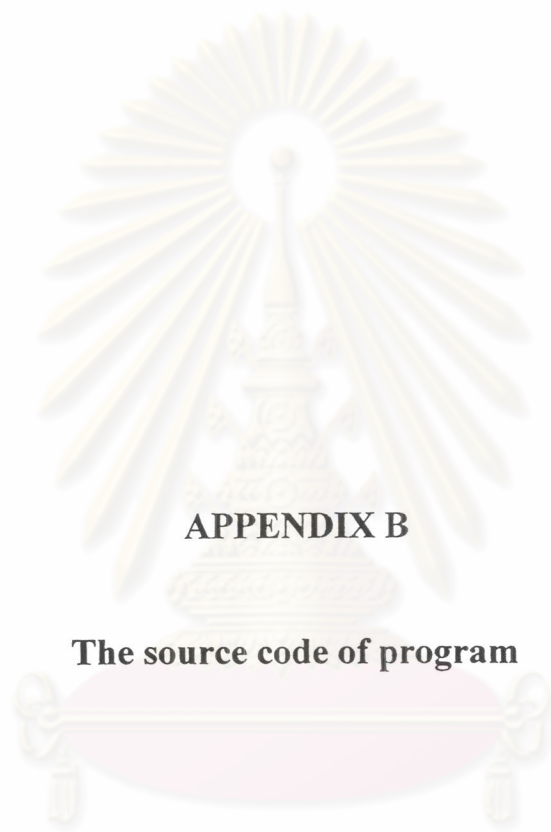
$$- N_3 = N_1 + (m-1) * N_{12} + (n-1) * N_{14}.$$

(m : Number of nodes on the line segment N_1 - N_2)

(n : Number of nodes on the line segment N_1 - N_4)



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APPENDIX B

The source code of program

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1. The source code of programmed of input data for control the analytical process

1.1 etest.mai (the analytical electric field)

SOL MOME	To control the procedure for optimizing the moment- configuration
GSCA 0.001	Sets the scale of material elements 0.001
* NOGO	Verifies input data without calculating physical quantities
* PASS GENE	Skips the process for constructing a set of determination equations of variables
* PASS SOLV	Succeeds the iteration process from the nonlinear calculation already finished
* NONL 0 0 0.0	Sets a condition in the nonlinear calculation
VOLT 1 0	Sets the electric potential elements 1 0 volt
VOLT 2 500	Sets the electric potential elements 2 250 volt
ECHO OFF	Permits or forbids outputting the input history to MAO
DMEG	Reads the data on material elements from MEG
END	
SOL MAS	
END	
SOL FIEL	To control the procedure for evaluating the electric field in space
GSCA 0.001	Sets the scale of material elements 0.001
ECHO OFF	
DMEG	
END	

1.2 btest.mai (the analytical beam data)

* ELECTRIC GUN

* ELF/BEAM

SOL BEAM

FILE ELFIN ETEST

* RELA

VOLT 1 20 1 0.00001

TIME 1 20 1 0.001

STEP 1 20 1 18

CHAR -1E-16

MASS 5.235987755E-13

RUBA 1.70588481E-9

STOP 1 20 1 -20 -20 -1 20 20 2

GSCAL 0.001

ECHO OFF

DMEG

END

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2. The source code of programmed for creation the element data and beam data.

2.1 etest.mei (creation the element data)

G30 1 0 0 0 creates a node on the coordinates (Node 1 is created on (0, 0, 0)).

G30 100 5 0 0.2 creates a node on the coordinates (Node 100 is created on (5, 0, 0.2)).

G30 150 10 0 0.2 creates a node on the coordinates (Node 150 is created on (10, 0, 0.2)).

FL0 1 100 1 1 creates a series of nodes between two already defined nodes (Nodes (N11=2,99) are created on the line 2-99)

FL0 100 150 1 1 creates a series of nodes between two already defined nodes (Nodes (N11=101,149) are created on the line 101-149)

R(149) 149 loop

E2 1(1) 1 1(1) 2(1)

R

G30 151 0 0 0.7 creates a node on the coordinates (Node 151 is created on (0, 0, 0.7)).

G30 200 10 0 0.7 creates a node on the coordinates (Node 200 is created on (0, 0, 0.7)).

FL0 151 200 1 1 creates a series of nodes between two already defined nodes (Nodes (N11=152,199) are created on the line 152-199)

R(49) 49 loop

E20 2 151(1) 152=

R

OG 1 10000 EGR1 defines the type of nodes and outputs the node data into MEO.

OE 1 10000 ESR defines the type of elements and outputs the element data into MEO

CG 1 10000 clears the data concerning the nodes in memory

CE 1 10000 clears the data concerning the elements in memory

R(2/2) starts double-loop mode of ELF/MESH

G30 1(10/1000) 0(1) 0 -0.01(/1.1) creates a node on the coordinates (Node 1 is created on (10/1000) 0(1) 0 -0.01(/1.1)).

R

FB0 1 11 1011 1001 1 100 1 1

R(10/10) starts double-loop mode of ELF/MESH

E4 1(1/100) 1 1(1/100) 2= 102= 101=

R

OG 1 10000 EGR2

OE 1 10000 ECO

2.1 btest.mei (creation the beam data)

* R(5)

* G30 1(1) 0(0.05) 0 0(0.005) creates a node on the coordinates (Node 1 is created on ((1) 0(0.05) 0 0(0.005))).

* R

G30 1 0.5 0 0.02 creates a node on the coordinates (Node 1 is created on 0.5, 0,0.02)

OG 1 20 BGR1

* R (2)

* G30 1(1) 0 0 1 creates a node on the coordinates (Node 1 is created on 0, 0, 1

* R

OG 1 20 BGR2



APPENDIX C

Position X, Y, Z from Output data (.mao)

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1. Output data from FLF/Bench for Toner trajectory

1.1 btest.mao

ELF/BEAM

VERSION 2.22A 20000927

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.....

MAS MEMORY = ALLOCATE

MAX. BEAM NUMBER = 90000

MAX. TIME STEP NUMBER = 90000

MAX. FILENAME LENGTH = 250

DATE 2002/11/7

TIME 15:44:45

btest.mei 1 TAG JUMP

btest.meo 1 TAG JUMP

btest.meg 1 TAG JUMP

btest.mep 1 TAG JUMP

btest.me1 1 TAG JUMP

btest.me2 1 TAG JUMP

btest.mai 1 TAG JUMP

btest.mao 1 TAG JUMP

btest.mag 1 TAG JUMP

btest.map 1 TAG JUMP

ELF-W = WARNING

ELF-E = ERROR

ELF-Q = QUIT

INPUT ECHO

PAGE= 1

-----++-----++-----++-----++-----++-----++-----++-----++-----++
1 SOL BEAM

2 FILE ELFIN ETEST

3 * RELA

4

5 VOLT 1 20 1 0.00001

6 TIME 1 20 1 0.001

7 STEP 1 20 1 18

8

9 CHAR -1E-16

10 MASS 5.235987755E-13

11 RUBA 1.70588481E-9

12

13 STOP 1 20 1 -20 -20 -1 20 20 2

14

15 GSCAL 0.001

16

17 ECHO OFF

* NOT BGR1 DATA LINE ARE COMMENT IN MEG FILE

* NOT BGR2 DATA LINE ARE COMMENT IN MEG FILE

+-----+-----+-----+-----+-----+-----+-----+-----+

23 INPUT CARDS READ

USED MEMORY OF MAS FILE = 0.8MB

1 MAGIC LABEL=

ELFIN LABEL=

BEAM LABEL=

GRID SCALE = 1.0000000E-03

** INITIAL CONDITION

CHARGE = -1.0000000E-16

MASS = 5.2359878E-13

PART = 10

RELA = NO RELATIVITY



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

BEAM	MAXSTEP	-V-	-	TIME-	-RATIO-	-BSCALE-	-ESCALE-
1	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
2	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
3	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
4	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
5	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
6	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
7	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
8	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
9	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
10	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
11	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
12	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
13	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
14	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
15	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
16	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
17	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
18	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
19	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00
20	18	1.00000E-05	1.00000E-03	1.00000E+00	1.00000E+00	1.00000E+00	1.00000E+00

จุฬาลงกรณ์มหาวิทยาลัย

BEAM	-	XMIN-	-YMIN-	-	ZMIN-	-XMAX-	YMAX-	-ZMAX-
1	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
2		-2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
3	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
4	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
5	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
6	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
7	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
8		-2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
9	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
10		-2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
11		-2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
12	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
13	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
14		-2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
15	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
16	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
17		2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
18		-2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
19		-2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00
20	-	2.0000E+01	-2.0000E+01	-	-1.0000E+00	2.0000E+01	2.0000E+01	2.0000E+00

** START OF BEAM 1

B SCALE = 1.0000000000E+00

E SCALE = 1.0000000000E+00 BEAM VELOCITY= 6.1803872330E-05 M/

STEP	TIME	-V-	-X-	-Y-	-Z-
1	1.00E-03	1.0984384203E+00	4.9937916E-04	-3.7794977E-19	3.5613495E-05
2	2.00E-03	4.6022896415E+00	4.9798147E-04	-8.9185063E-19	7.2429294E-05
3	3.00E-03	4.7256801396E+00	4.9653076E-04	-1.1644724E-18	1.1475816E-04
4	4.00E-03	4.7570425467E+00	4.9522984E-04	-1.2417878E-18	1.5733181E-04
5	5.00E-03	4.7853555029E+00	4.9406714E-04	-1.2708617E-18	2.0003951E-04
6	6.00E-03	4.8120487932E+00	4.9303276E-04	-1.2561720E-18	2.4287144E-04
7	7.00E-03	4.8369194437E+00	4.9211771E-04	-1.2117734E-18	2.8581875E-04
8	8.00E-03	4.8597821112E+00	4.9131385E-04	-1.1515502E-18	3.2887196E-04
9	9.00E-03	4.8804925049E+00	4.9061395E-04	-1.0967914E-18	3.7202102E-04
10	1.00E-02	4.8989426553E+00	4.9001171E-04	-9.8827691E-19	4.1525552E-04
11	1.10E-02	4.9150550704E+00	4.8950174E-04	-8.5763122E-19	4.5856476E-04
12	1.20E-02	4.9287776090E+00	4.8907946E-04	-7.1272763E-19	5.0193792E-04
13	1.30E-02	4.9400830707E+00	4.8874105E-04	-4.9609971E-19	5.4536409E-04
14	1.40E-02	4.9489876904E+00	4.8848318E-04	-2.5957289E-19	5.8883247E-04
15	1.50E-02	4.9556380331E+00	4.8830217E-04	1.1878754E-19	6.3233279E-04
16	1.60E-02	4.9605557250E+00	4.8819173E-04	8.6408065E-19	6.7585673E-04
17	1.70E-02	4.9646069585E+00	4.8813751E-04	2.1772403E-18	7.1939947E-04
18	1.80E-02	5.5834977538E-03	4.8811621E-04	3.2302756E-18	7.2861259E-04

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

STEP	-VX-	-VY-	-VZ-	-AX-	-AY-	-AZ-
1	-8.3303E-04	-4.9544E-16	2.0467E-02	-8.5562E-02	-4.7376E-14	1.9568E+00
2	-1.5732E-03	-5.1964E-16	4.1898E-02	-7.0780E-02	-2.3136E-15	2.0494E+00
3	-1.4126E-03	-1.9583E-16	4.2463E-02	1.5358E-02	3.0963E-14	5.3967E-02
4	-1.2662E-03	-4.0472E-17	4.2608E-02	1.4002E-02	1.4856E-14	1.3906E-02
5	-1.1305E-03	-2.5530E-17	4.2739E-02	1.2973E-02	1.4288E-15	1.2481E-02
6	-1.0045E-03	2.7193E-17	4.2861E-02	1.2053E-02	5.0415E-15	1.1691E-02
7	-8.8725E-04	4.9747E-17	4.2974E-02	1.1210E-02	2.1567E-15	1.0830E-02
8	-7.7794E-04	6.3480E-17	4.3078E-02	1.0452E-02	1.3131E-15	9.9064E-03
9	-6.7564E-04	5.2048E-17	4.3171E-02	9.7823E-03	-1.0932E-15	8.9354E-03
10	-5.7942E-04	1.2607E-16	4.3254E-02	9.2007E-03	7.0780E-15	7.9310E-03
11	-4.8839E-04	1.3207E-16	4.3326E-02	8.7043E-03	5.7376E-16	6.9046E-03
12	-4.0173E-04	1.4889E-16	4.3388E-02	8.2871E-03	1.6088E-15	5.8652E-03
13	-3.1872E-04	2.3768E-16	4.3438E-02	7.9374E-03	8.4904E-15	4.8217E-03
14	-2.3897E-04	2.3617E-16	4.3478E-02	7.6261E-03	-1.4513E-16	3.7910E-03
15	-1.6298E-04	4.2256E-16	4.3507E-02	7.2655E-03	1.7824E-14	2.8261E-03
16	-9.4111E-05	8.4562E-16	4.3529E-02	6.5859E-03	4.0454E-14	2.0832E-03
17	-4.1818E-05	1.4585E-15	4.3547E-02	5.0003E-03	5.8605E-14	1.7071E-03
18	-1.4915E-05	9.2699E-16	-1.4603E-03	2.5725E-03	-5.0825E-14	-4.3037E+00

TIME 15:44:49

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

1.2 Position X, Y, Z of the toner jumping trajectory from Output data

(btest.mao)

TableC-1 The position of toner trajectory at the cone depth of dented electrode 0.2mm and the applied voltage 500V in unit (mm)

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	1.10E+00	4.99E-04	-3.78E-19	3.56E-05	0.4994	0.0000	0.0356
2	2.00E-03	4.60E+00	4.98E-04	-8.92E-19	7.24E-05	0.4980	0.0000	0.0724
3	3.00E-03	4.73E+00	4.97E-04	-1.16E-18	1.15E-04	0.4965	0.0000	0.1148
4	4.00E-03	4.76E+00	4.95E-04	-1.24E-18	1.57E-04	0.4952	0.0000	0.1573
5	5.00E-03	4.79E+00	4.94E-04	-1.27E-18	2.00E-04	0.4941	0.0000	0.2000
6	6.00E-03	4.81E+00	4.93E-04	-1.26E-18	2.43E-04	0.4930	0.0000	0.2429
7	7.00E-03	4.84E+00	4.92E-04	-1.21E-18	2.86E-04	0.4921	0.0000	0.2858
8	8.00E-03	4.86E+00	4.91E-04	-1.15E-18	3.29E-04	0.4913	0.0000	0.3289
9	9.00E-03	4.88E+00	4.91E-04	-1.10E-18	3.72E-04	0.4906	0.0000	0.3720
10	1.00E-02	4.90E+00	4.90E-04	-9.88E-19	4.15E-04	0.4900	0.0000	0.4153
11	1.10E-02	4.92E+00	4.90E-04	-8.58E-19	4.59E-04	0.4895	0.0000	0.4586
12	1.20E-02	4.93E+00	4.89E-04	-7.13E-19	5.02E-04	0.4891	0.0000	0.5019
13	1.30E-02	4.94E+00	4.89E-04	-4.96E-19	5.45E-04	0.4887	0.0000	0.5454
14	1.40E-02	4.95E+00	4.88E-04	-2.60E-19	5.89E-04	0.4885	0.0000	0.5888
15	1.50E-02	4.96E+00	4.88E-04	1.19E-19	6.32E-04	0.4883	0.0000	0.6323
16	1.60E-02	4.96E+00	4.88E-04	8.64E-19	6.76E-04	0.4882	0.0000	0.6759
17	1.70E-02	4.96E+00	4.88E-04	2.18E-18	7.19E-04	0.4881	0.0000	0.7194
18	1.80E-02	5.58E-03	4.88E-04	3.23E-18	7.29E-04	0.4881	0.0000	0.7286
1	1.00E-03	4.77E+00	4.88E-04	-5.17E-20	6.43E-04	0.4882	0.0000	0.6433
2	2.00E-03	4.95E+00	4.88E-04	-7.45E-19	6.00E-04	0.4884	0.0000	0.6000
3	3.00E-03	4.95E+00	4.89E-04	-1.08E-18	5.57E-04	0.4886	0.0000	0.5565

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
4	4.00E-03	4.94E+00	4.89E-04	-1.30E-18	5.13E-04	0.4888	0.0000	0.5130
5	5.00E-03	4.93E+00	4.89E-04	-1.46E-18	4.70E-04	0.4892	0.0000	0.4696
6	6.00E-03	4.92E+00	4.90E-04	-1.55E-18	4.26E-04	0.4896	0.0000	0.4263
7	7.00E-03	4.90E+00	4.90E-04	-1.66E-18	3.83E-04	0.4902	0.0000	0.3830
8	8.00E-03	4.89E+00	4.91E-04	-1.73E-18	3.40E-04	0.4908	0.0000	0.3398
9	9.00E-03	4.87E+00	4.92E-04	-1.79E-18	2.97E-04	0.4915	0.0000	0.2966
10	1.00E-02	4.84E+00	4.92E-04	-1.83E-18	2.54E-04	0.4924	0.0000	0.2536
11	1.10E-02	4.82E+00	4.93E-04	-1.87E-18	2.11E-04	0.4933	0.0000	0.2107
12	1.20E-02	4.79E+00	4.94E-04	-1.91E-18	1.68E-04	0.4944	0.0000	0.1679
13	1.30E-02	4.76E+00	4.96E-04	-1.94E-18	1.25E-04	0.4956	0.0000	0.1252
14	1.40E-02	4.74E+00	4.97E-04	-1.81E-18	8.27E-05	0.4969	0.0000	0.0827
15	1.50E-02	4.71E+00	4.98E-04	-1.49E-18	4.03E-05	0.4984	0.0000	0.0403
16	1.60E-02	3.16E-04	4.99E-04	-1.32E-18	3.00E-05	0.4988	0.0000	0.0300
1	1.00E-03	4.51E+00	4.98E-04	-1.83E-18	6.16E-05	0.4975	0.0000	0.0616
2	2.00E-03	4.72E+00	4.96E-04	-2.16E-18	1.04E-04	0.4960	0.0000	0.1038
3	3.00E-03	4.75E+00	4.95E-04	-2.27E-18	1.46E-04	0.4947	0.0000	0.1463
4	4.00E-03	4.78E+00	4.94E-04	-2.30E-18	1.89E-04	0.4935	0.0000	0.1890
5	5.00E-03	4.80E+00	4.92E-04	-2.30E-18	2.32E-04	0.4924	0.0000	0.2318
6	6.00E-03	4.83E+00	4.91E-04	-2.25E-18	2.75E-04	0.4915	0.0000	0.2747
7	7.00E-03	4.85E+00	4.91E-04	-2.20E-18	3.18E-04	0.4907	0.0000	0.3177
8	8.00E-03	4.87E+00	4.90E-04	-2.11E-18	3.61E-04	0.4899	0.0000	0.3608
9	9.00E-03	4.89E+00	4.89E-04	-2.03E-18	4.04E-04	0.4893	0.0000	0.4040
10	1.00E-02	4.91E+00	4.89E-04	-1.92E-18	4.47E-04	0.4888	0.0000	0.4473
11	1.10E-02	4.93E+00	4.88E-04	-1.82E-18	4.91E-04	0.4883	0.0000	0.4907
12	1.20E-02	4.94E+00	4.88E-04	-1.67E-18	5.34E-04	0.4880	0.0000	0.5341
13	1.30E-02	4.95E+00	4.88E-04	-1.45E-18	5.78E-04	0.4877	0.0000	0.5776
14	1.40E-02	4.95E+00	4.87E-04	-1.12E-18	6.21E-04	0.4875	0.0000	0.6210
15	1.50E-02	4.96E+00	4.87E-04	-5.09E-19	6.65E-04	0.4874	0.0000	0.6646

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
16	1.60E-02	4.96E+00	4.87E-04	7.14E-19	7.08E-04	0.4873	0.0000	0.7081
17	1.70E-02	5.61E-03	4.87E-04	1.93E-18	7.17E-04	0.4873	0.0000	0.7173
18	1.80E-02	1.43E-02	4.87E-04	3.22E-18	7.15E-04	0.4872	0.0000	0.7152
1	1.00E-03	4.77E+00	4.87E-04	-1.27E-18	6.32E-04	0.4874	0.0000	0.6320
2	2.00E-03	4.95E+00	4.88E-04	-1.84E-18	5.89E-04	0.4876	0.0000	0.5887
3	3.00E-03	4.95E+00	4.88E-04	-2.14E-18	5.45E-04	0.4878	0.0000	0.5452
4	4.00E-03	4.94E+00	4.88E-04	-2.35E-18	5.02E-04	0.4881	0.0000	0.5018
5	5.00E-03	4.93E+00	4.88E-04	-2.53E-18	4.58E-04	0.4885	0.0000	0.4584
6	6.00E-03	4.92E+00	4.89E-04	-2.66E-18	4.15E-04	0.4889	0.0000	0.4150
7	7.00E-03	4.90E+00	4.89E-04	-2.75E-18	3.72E-04	0.4895	0.0000	0.3718
8	8.00E-03	4.88E+00	4.90E-04	-2.85E-18	3.29E-04	0.4901	0.0000	0.3286
9	9.00E-03	4.86E+00	4.91E-04	-2.93E-18	2.85E-04	0.4909	0.0000	0.2855
10	1.00E-02	4.84E+00	4.92E-04	-2.98E-18	2.42E-04	0.4917	0.0000	0.2425
11	1.10E-02	4.81E+00	4.93E-04	-3.04E-18	2.00E-04	0.4927	0.0000	0.1996
12	1.20E-02	4.79E+00	4.94E-04	-3.09E-18	1.57E-04	0.4938	0.0000	0.1568
13	1.30E-02	4.76E+00	4.95E-04	-3.05E-18	1.14E-04	0.4950	0.0000	0.1142
14	1.40E-02	4.73E+00	4.96E-04	-2.91E-18	7.17E-05	0.4964	0.0000	0.0717
15	1.50E-02	4.70E+00	4.98E-04	-2.53E-18	2.93E-05	0.4979	0.0000	0.0293
16	1.60E-02	2.43E-04	4.98E-04	-2.24E-18	1.91E-05	0.4983	0.0000	0.0191
17	1.70E-02	5.83E-04	4.98E-04	-2.11E-18	1.93E-05	0.4983	0.0000	0.0193
1	1.00E-03	4.50E+00	4.97E-04	-3.08E-18	6.09E-05	0.4967	0.0000	0.0609
2	2.00E-03	4.71E+00	4.95E-04	-3.44E-18	1.03E-04	0.4952	0.0000	0.1031
3	3.00E-03	4.75E+00	4.94E-04	-3.56E-18	1.46E-04	0.4939	0.0000	0.1456
4	4.00E-03	4.78E+00	4.93E-04	-3.58E-18	1.88E-04	0.4927	0.0000	0.1883
5	5.00E-03	4.80E+00	4.92E-04	-3.56E-18	2.31E-04	0.4916	0.0000	0.2311
6	6.00E-03	4.83E+00	4.91E-04	-3.54E-18	2.74E-04	0.4907	0.0000	0.2740
7	7.00E-03	4.85E+00	4.90E-04	-3.48E-18	3.17E-04	0.4898	0.0000	0.3170
8	8.00E-03	4.87E+00	4.89E-04	-3.40E-18	3.60E-04	0.4891	0.0000	0.3602

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
9	9.00E-03	4.89E+00	4.88E-04	-3.27E-18	4.03E-04	0.4885	0.0000	0.4034
10	1.00E-02	4.91E+00	4.88E-04	-3.17E-18	4.47E-04	0.4879	0.0000	0.4467
11	1.10E-02	4.92E+00	4.88E-04	-3.05E-18	4.90E-04	0.4875	0.0000	0.4900
12	1.20E-02	4.94E+00	4.87E-04	-2.91E-18	5.33E-04	0.4871	0.0000	0.5334
13	1.30E-02	4.95E+00	4.87E-04	-2.69E-18	5.77E-04	0.4869	0.0000	0.5769
14	1.40E-02	4.95E+00	4.87E-04	-2.38E-18	6.20E-04	0.4867	0.0000	0.6204
15	1.50E-02	4.96E+00	4.87E-04	-1.77E-18	6.64E-04	0.4865	0.0000	0.6639
16	1.60E-02	4.96E+00	4.86E-04	-7.80E-19	7.00E-04	0.4865	0.0000	0.7000
1	1.00E-03	4.77E+00	4.87E-04	-2.52E-18	6.31E-04	0.4866	0.0000	0.6313
2	2.00E-03	4.95E+00	4.87E-04	-3.08E-18	5.88E-04	0.4867	0.0000	0.5880
3	3.00E-03	4.95E+00	4.87E-04	-3.38E-18	5.45E-04	0.4870	0.0000	0.5446
4	4.00E-03	4.94E+00	4.87E-04	-3.58E-18	5.01E-04	0.4873	0.0000	0.5011
5	5.00E-03	4.93E+00	4.88E-04	-3.73E-18	4.58E-04	0.4876	0.0000	0.4577
6	6.00E-03	4.91E+00	4.88E-04	-3.85E-18	4.14E-04	0.4881	0.0000	0.4144
7	7.00E-03	4.90E+00	4.89E-04	-3.94E-18	3.71E-04	0.4887	0.0000	0.3711
8	8.00E-03	4.88E+00	4.89E-04	-4.03E-18	3.28E-04	0.4893	0.0000	0.3279
9	9.00E-03	4.86E+00	4.90E-04	-4.10E-18	2.85E-04	0.4901	0.0000	0.2848
10	1.00E-02	4.84E+00	4.91E-04	-4.14E-18	2.42E-04	0.4909	0.0000	0.2418
11	1.10E-02	4.81E+00	4.92E-04	-4.18E-18	1.99E-04	0.4919	0.0000	0.1989
12	1.20E-02	4.78E+00	4.93E-04	-4.21E-18	1.56E-04	0.4930	0.0000	0.1562
13	1.30E-02	4.76E+00	4.94E-04	-4.18E-18	1.14E-04	0.4942	0.0000	0.1135
14	1.40E-02	4.73E+00	4.96E-04	-4.01E-18	7.10E-05	0.4956	0.0000	0.0710
15	1.50E-02	4.70E+00	4.97E-04	-3.57E-18	2.87E-05	0.4971	0.0000	0.0287
16	1.60E-02	2.41E-04	4.98E-04	-3.27E-18	1.84E-05	0.4975	0.0000	0.0184
17	1.70E-02	5.93E-04	4.97E-04	-3.15E-18	1.87E-05	0.4975	0.0000	0.0187

Table C-2 The position of toner trajectory at the cone depth of dented electrode 0.5mm and the applied voltage 500V in unit (mm)

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	5.03E-01	4.99E-04	-2.42E-19	6.05E-05	0.4989	0.0000	0.0605
2	2.00E-03	2.14E+00	4.97E-04	-7.43E-19	8.55E-05	0.4965	0.0000	0.0855
3	3.00E-03	2.21E+00	4.94E-04	-1.07E-18	1.14E-04	0.4939	0.0000	0.1143
4	4.00E-03	2.23E+00	4.91E-04	-1.20E-18	1.43E-04	0.4915	0.0000	0.1434
5	5.00E-03	2.26E+00	4.89E-04	-1.25E-18	1.73E-04	0.4892	0.0000	0.1727
6	6.00E-03	2.29E+00	4.87E-04	-1.26E-18	2.02E-04	0.4870	0.0000	0.2021
7	7.00E-03	2.31E+00	4.85E-04	-1.24E-18	2.32E-04	0.4850	0.0000	0.2317
8	8.00E-03	2.34E+00	4.83E-04	-1.21E-18	2.61E-04	0.4831	0.0000	0.2615
9	9.00E-03	2.36E+00	4.81E-04	-1.18E-18	2.91E-04	0.4813	0.0000	0.2914
10	1.00E-02	2.38E+00	4.80E-04	-1.13E-18	3.21E-04	0.4797	0.0000	0.3215
11	1.10E-02	2.41E+00	4.78E-04	-1.07E-18	3.52E-04	0.4782	0.0000	0.3517
12	1.20E-02	2.43E+00	4.77E-04	-1.02E-18	3.82E-04	0.4767	0.0000	0.3821
13	1.30E-02	2.45E+00	4.75E-04	-9.73E-19	4.13E-04	0.4754	0.0000	0.4126
14	1.40E-02	2.47E+00	4.74E-04	-9.13E-19	4.43E-04	0.4741	0.0000	0.4433
15	1.50E-02	2.49E+00	4.73E-04	-8.37E-19	4.74E-04	0.4730	0.0000	0.4741
16	1.60E-02	2.51E+00	4.72E-04	-7.38E-19	5.05E-04	0.4719	0.0000	0.5050
17	1.70E-02	2.53E+00	4.71E-04	-6.42E-19	5.36E-04	0.4709	0.0000	0.5360
18	1.80E-02	2.54E+00	4.70E-04	-5.27E-19	5.67E-04	0.4700	0.0000	0.5672
19	1.90E-02	2.56E+00	4.69E-04	-4.18E-19	5.98E-04	0.4692	0.0000	0.5984
20	2.00E-02	2.57E+00	4.68E-04	-3.20E-19	6.30E-04	0.4684	0.0000	0.6297
21	2.10E-02	2.59E+00	4.68E-04	-2.40E-19	6.61E-04	0.4677	0.0000	0.6611
22	2.20E-02	2.60E+00	4.67E-04	-1.79E-19	6.93E-04	0.4671	0.0000	0.6926
23	2.30E-02	2.61E+00	4.67E-04	-9.40E-20	7.24E-04	0.4665	0.0000	0.7242
24	2.40E-02	2.62E+00	4.66E-04	1.82E-21	7.56E-04	0.4661	0.0000	0.7558

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
25	2.50E-02	2.63E+00	4.66E-04	9.69E-20	7.87E-04	0.4656	0.0000	0.7875
26	2.60E-02	2.64E+00	4.65E-04	2.07E-19	8.19E-04	0.4652	0.0000	0.8192
27	2.70E-02	2.64E+00	4.65E-04	3.26E-19	8.51E-04	0.4649	0.0000	0.8510
28	2.80E-02	2.65E+00	4.65E-04	4.92E-19	8.83E-04	0.4647	0.0000	0.8828
29	2.90E-02	2.65E+00	4.64E-04	7.27E-19	9.15E-04	0.4645	0.0000	0.9146
30	3.00E-02	2.66E+00	4.64E-04	1.10E-18	9.46E-04	0.4643	0.0000	0.9465
31	3.10E-02	2.66E+00	4.64E-04	1.74E-18	9.78E-04	0.4642	0.0000	0.9783
1	1.00E-03	2.56E+00	4.64E-04	9.86E-19	9.54E-04	0.4643	0.0000	0.9545
2	2.00E-03	2.66E+00	4.64E-04	3.93E-19	9.23E-04	0.4644	0.0000	0.9228
3	3.00E-03	2.65E+00	4.65E-04	6.39E-20	8.91E-04	0.4645	0.0000	0.8909
4	4.00E-03	2.65E+00	4.65E-04	-1.55E-19	8.59E-04	0.4648	0.0000	0.8591
5	5.00E-03	2.65E+00	4.65E-04	-3.62E-19	8.27E-04	0.4650	0.0000	0.8273
6	6.00E-03	2.64E+00	4.65E-04	-5.26E-19	7.96E-04	0.4654	0.0000	0.7955
7	7.00E-03	2.63E+00	4.66E-04	-6.41E-19	7.64E-04	0.4657	0.0000	0.7638
8	8.00E-03	2.62E+00	4.66E-04	-7.41E-19	7.32E-04	0.4662	0.0000	0.7322
9	9.00E-03	2.61E+00	4.67E-04	-8.42E-19	7.01E-04	0.4667	0.0000	0.7006
10	1.00E-02	2.60E+00	4.67E-04	-9.47E-19	6.69E-04	0.4673	0.0000	0.6690
11	1.10E-02	2.59E+00	4.68E-04	-1.05E-18	6.38E-04	0.4679	0.0000	0.6376
12	1.20E-02	2.58E+00	4.69E-04	-1.15E-18	6.06E-04	0.4686	0.0000	0.6062
13	1.30E-02	2.56E+00	4.69E-04	-1.27E-18	5.75E-04	0.4694	0.0000	0.5749
14	1.40E-02	2.55E+00	4.70E-04	-1.37E-18	5.44E-04	0.4703	0.0000	0.5437
15	1.50E-02	2.53E+00	4.71E-04	-1.46E-18	5.13E-04	0.4712	0.0000	0.5126
16	1.60E-02	2.51E+00	4.72E-04	-1.54E-18	4.82E-04	0.4722	0.0000	0.4816
17	1.70E-02	2.50E+00	4.73E-04	-1.60E-18	4.51E-04	0.4733	0.0000	0.4507
18	1.80E-02	2.48E+00	4.74E-04	-1.66E-18	4.20E-04	0.4744	0.0000	0.4199
19	1.90E-02	2.46E+00	4.76E-04	-1.73E-18	3.89E-04	0.4757	0.0000	0.3893
20	2.00E-02	2.43E+00	4.77E-04	-1.80E-18	3.59E-04	0.4771	0.0000	0.3588
21	2.10E-02	2.41E+00	4.79E-04	-1.91E-18	3.28E-04	0.4785	0.0000	0.3284

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
22	2.20E-02	2.39E+00	4.80E-04	-2.01E-18	2.98E-04	0.4801	0.0000	0.2982
23	2.30E-02	2.37E+00	4.82E-04	-2.04E-18	2.68E-04	0.4818	0.0000	0.2682
24	2.40E-02	2.34E+00	4.84E-04	-2.07E-18	2.38E-04	0.4836	0.0000	0.2383
25	2.50E-02	2.32E+00	4.85E-04	-2.10E-18	2.09E-04	0.4855	0.0000	0.2086
26	2.60E-02	2.29E+00	4.88E-04	-2.12E-18	1.79E-04	0.4875	0.0000	0.1790
27	2.70E-02	2.27E+00	4.90E-04	-2.12E-18	1.50E-04	0.4897	0.0000	0.1497
28	2.80E-02	2.24E+00	4.92E-04	-2.05E-18	1.20E-04	0.4921	0.0000	0.1205
29	2.90E-02	2.21E+00	4.95E-04	-1.85E-18	9.14E-05	0.4946	0.0000	0.0914
30	3.00E-02	2.19E+00	4.97E-04	-1.44E-18	6.26E-05	0.4972	0.0000	0.0626
31	3.10E-02	5.44E-06	4.98E-04	-1.59E-18	5.57E-05	0.4979	0.0000	0.0557
1	1.00E-03	2.09E+00	4.96E-04	-2.20E-18	7.72E-05	0.4958	0.0000	0.0772
2	2.00E-03	2.20E+00	4.93E-04	-2.65E-18	1.06E-04	0.4931	0.0000	0.1059
3	3.00E-03	2.23E+00	4.91E-04	-2.87E-18	1.35E-04	0.4906	0.0000	0.1349
4	4.00E-03	2.25E+00	4.88E-04	-2.96E-18	1.64E-04	0.4883	0.0000	0.1641
5	5.00E-03	2.28E+00	4.86E-04	-3.01E-18	1.93E-04	0.4861	0.0000	0.1934
6	6.00E-03	2.30E+00	4.84E-04	-3.01E-18	2.23E-04	0.4840	0.0000	0.2230
7	7.00E-03	2.33E+00	4.82E-04	-2.98E-18	2.53E-04	0.4821	0.0000	0.2527
8	8.00E-03	2.35E+00	4.80E-04	-2.92E-18	2.83E-04	0.4803	0.0000	0.2826
9	9.00E-03	2.38E+00	4.79E-04	-2.87E-18	3.13E-04	0.4786	0.0000	0.3126
10	1.00E-02	2.40E+00	4.77E-04	-2.81E-18	3.43E-04	0.4770	0.0000	0.3428
11	1.10E-02	2.42E+00	4.76E-04	-2.72E-18	3.73E-04	0.4756	0.0000	0.3732
12	1.20E-02	2.44E+00	4.74E-04	-2.65E-18	4.04E-04	0.4742	0.0000	0.4036
13	1.30E-02	2.46E+00	4.73E-04	-2.58E-18	4.34E-04	0.4730	0.0000	0.4343
14	1.40E-02	2.48E+00	4.72E-04	-2.50E-18	4.65E-04	0.4718	0.0000	0.4650
15	1.50E-02	2.50E+00	4.71E-04	-2.39E-18	4.96E-04	0.4707	0.0000	0.4959
16	1.60E-02	2.52E+00	4.70E-04	-2.31E-18	5.27E-04	0.4697	0.0000	0.5269
17	1.70E-02	2.54E+00	4.69E-04	-2.21E-18	5.58E-04	0.4688	0.0000	0.5580
18	1.80E-02	2.55E+00	4.68E-04	-2.13E-18	5.89E-04	0.4679	0.0000	0.5892

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
19	1.90E-02	2.57E+00	4.67E-04	-2.05E-18	6.20E-04	0.4671	0.0000	0.6205
20	2.00E-02	2.58E+00	4.66E-04	-1.97E-18	6.52E-04	0.4664	0.0000	0.6519
21	2.10E-02	2.60E+00	4.66E-04	-1.88E-18	6.83E-04	0.4658	0.0000	0.6833
22	2.20E-02	2.61E+00	4.65E-04	-1.80E-18	7.15E-04	0.4652	0.0000	0.7148
23	2.30E-02	2.62E+00	4.65E-04	-1.69E-18	7.46E-04	0.4647	0.0000	0.7464
24	2.40E-02	2.63E+00	4.64E-04	-1.59E-18	7.78E-04	0.4642	0.0000	0.7781
25	2.50E-02	2.63E+00	4.64E-04	-1.43E-18	8.10E-04	0.4638	0.0000	0.8098
26	2.60E-02	2.64E+00	4.64E-04	-1.28E-18	8.42E-04	0.4635	0.0000	0.8416
27	2.70E-02	2.65E+00	4.63E-04	-1.11E-18	8.73E-04	0.4632	0.0000	0.8734
28	2.80E-02	2.65E+00	4.63E-04	-8.76E-19	9.05E-04	0.4630	0.0000	0.9052
29	2.90E-02	2.66E+00	4.63E-04	-5.54E-19	9.37E-04	0.4629	0.0000	0.9370
30	3.00E-02	2.66E+00	4.63E-04	-2.14E-20	9.69E-04	0.4628	0.0000	0.9689
31	3.10E-02	2.66E+00	4.63E-04	9.47E-19	1.00E-03	0.4627	0.0000	1.0008
1	1.00E-03	2.56E+00	4.63E-04	-6.59E-19	9.45E-04	0.4628	0.0000	0.9450
2	2.00E-03	2.66E+00	4.63E-04	-1.18E-18	9.13E-04	0.4629	0.0000	0.9133
3	3.00E-03	2.65E+00	4.63E-04	-1.49E-18	8.82E-04	0.4631	0.0000	0.8815
4	4.00E-03	2.65E+00	4.63E-04	-1.68E-18	8.50E-04	0.4633	0.0000	0.8497
5	5.00E-03	2.64E+00	4.64E-04	-1.89E-18	8.18E-04	0.4636	0.0000	0.8179
6	6.00E-03	2.64E+00	4.64E-04	-2.05E-18	7.86E-04	0.4639	0.0000	0.7862
7	7.00E-03	2.63E+00	4.64E-04	-2.20E-18	7.54E-04	0.4644	0.0000	0.7545
8	8.00E-03	2.62E+00	4.65E-04	-2.32E-18	7.23E-04	0.4648	0.0000	0.7228
9	9.00E-03	2.61E+00	4.65E-04	-2.45E-18	6.91E-04	0.4653	0.0000	0.6912
10	1.00E-02	2.60E+00	4.66E-04	-2.57E-18	6.60E-04	0.4659	0.0000	0.6597
11	1.10E-02	2.59E+00	4.67E-04	-2.66E-18	6.28E-04	0.4666	0.0000	0.6283
12	1.20E-02	2.57E+00	4.67E-04	-2.77E-18	5.97E-04	0.4673	0.0000	0.5969
13	1.30E-02	2.56E+00	4.68E-04	-2.88E-18	5.66E-04	0.4681	0.0000	0.5657
14	1.40E-02	2.54E+00	4.69E-04	-2.98E-18	5.34E-04	0.4690	0.0000	0.5345
15	1.50E-02	2.53E+00	4.70E-04	-3.11E-18	5.03E-04	0.4699	0.0000	0.5034

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
13	1.30E-02	2.46E+00	4.72E-04	-3.92E-18	4.33E-04	0.4715	0.0000	0.4326
14	1.40E-02	2.48E+00	4.70E-04	-3.83E-18	4.63E-04	0.4703	0.0000	0.4633
15	1.50E-02	2.50E+00	4.69E-04	-3.75E-18	4.94E-04	0.4692	0.0000	0.4942
16	1.60E-02	2.52E+00	4.68E-04	-3.64E-18	5.25E-04	0.4682	0.0000	0.5251
17	1.70E-02	2.54E+00	4.67E-04	-3.56E-18	5.56E-04	0.4673	0.0000	0.5562
18	1.80E-02	2.55E+00	4.66E-04	-3.46E-18	5.87E-04	0.4664	0.0000	0.5874
19	1.90E-02	2.57E+00	4.66E-04	-3.38E-18	6.19E-04	0.4657	0.0000	0.6187
20	2.00E-02	2.58E+00	4.65E-04	-3.28E-18	6.50E-04	0.4649	0.0000	0.6501
21	2.10E-02	2.59E+00	4.64E-04	-3.16E-18	6.82E-04	0.4643	0.0000	0.6815
22	2.20E-02	2.61E+00	4.64E-04	-3.07E-18	7.13E-04	0.4637	0.0000	0.7131
23	2.30E-02	2.62E+00	4.63E-04	-2.96E-18	7.45E-04	0.4632	0.0000	0.7446
24	2.40E-02	2.63E+00	4.63E-04	-2.81E-18	7.76E-04	0.4627	0.0000	0.7763
25	2.50E-02	2.63E+00	4.62E-04	-2.67E-18	8.08E-04	0.4624	0.0000	0.8080
26	2.60E-02	2.64E+00	4.62E-04	-2.52E-18	8.40E-04	0.4620	0.0000	0.8397
27	2.70E-02	2.65E+00	4.62E-04	-2.35E-18	8.72E-04	0.4617	0.0000	0.8715
28	2.80E-02	2.65E+00	4.62E-04	-2.13E-18	9.03E-04	0.4615	0.0000	0.9033
29	2.90E-02	2.66E+00	4.61E-04	-1.84E-18	9.35E-04	0.4614	0.0000	0.9352
30	3.00E-02	2.66E+00	4.61E-04	-1.31E-18	9.67E-04	0.4613	0.0000	0.9670
31	3.10E-02	2.66E+00	4.61E-04	-3.94E-19	9.99E-04	0.4612	0.0000	0.9989
1	1.00E-03	2.56E+00	4.61E-04	-1.27E-18	9.75E-04	0.4612	0.0000	0.9751
2	2.00E-03	2.66E+00	4.61E-04	-2.08E-18	9.43E-04	0.4613	0.0000	0.9434
3	3.00E-03	2.66E+00	4.61E-04	-2.57E-18	9.11E-04	0.4614	0.0000	0.9115
4	4.00E-03	2.65E+00	4.62E-04	-2.88E-18	8.80E-04	0.4616	0.0000	0.8797
5	5.00E-03	2.65E+00	4.62E-04	-3.10E-18	8.48E-04	0.4618	0.0000	0.8479
6	6.00E-03	2.64E+00	4.62E-04	-3.29E-18	8.16E-04	0.4621	0.0000	0.8161
7	7.00E-03	2.64E+00	4.62E-04	-3.45E-18	7.84E-04	0.4625	0.0000	0.7843
8	8.00E-03	2.63E+00	4.63E-04	-3.59E-18	7.53E-04	0.4629	0.0000	0.7526
9	9.00E-03	2.62E+00	4.63E-04	-3.72E-18	7.21E-04	0.4633	0.0000	0.7210

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
10	1.00E-02	2.61E+00	4.64E-04	-3.82E-18	6.89E-04	0.4639	0.0000	0.6894
11	1.10E-02	2.60E+00	4.64E-04	-3.94E-18	6.58E-04	0.4645	0.0000	0.6579
12	1.20E-02	2.58E+00	4.65E-04	-4.04E-18	6.26E-04	0.4651	0.0000	0.6265
13	1.30E-02	2.57E+00	4.66E-04	-4.14E-18	5.95E-04	0.4658	0.0000	0.5951
14	1.40E-02	2.56E+00	4.67E-04	-4.26E-18	5.64E-04	0.4666	0.0000	0.5639
15	1.50E-02	2.54E+00	4.68E-04	-4.35E-18	5.33E-04	0.4675	0.0000	0.5327
16	1.60E-02	2.52E+00	4.68E-04	-4.44E-18	5.02E-04	0.4685	0.0000	0.5017
17	1.70E-02	2.51E+00	4.69E-04	-4.54E-18	4.71E-04	0.4695	0.0000	0.4707
18	1.80E-02	2.49E+00	4.71E-04	-4.62E-18	4.40E-04	0.4706	0.0000	0.4399
19	1.90E-02	2.47E+00	4.72E-04	-4.67E-18	4.09E-04	0.4718	0.0000	0.4092
20	2.00E-02	2.45E+00	4.73E-04	-4.74E-18	3.79E-04	0.4731	0.0000	0.3786
21	2.10E-02	2.43E+00	4.74E-04	-4.82E-18	3.48E-04	0.4745	0.0000	0.3482
22	2.20E-02	2.40E+00	4.76E-04	-4.89E-18	3.18E-04	0.4760	0.0000	0.3179
23	2.30E-02	2.38E+00	4.78E-04	-4.98E-18	2.88E-04	0.4776	0.0000	0.2877
24	2.40E-02	2.36E+00	4.79E-04	-5.04E-18	2.58E-04	0.4793	0.0000	0.2577
25	2.50E-02	2.33E+00	4.81E-04	-5.09E-18	2.28E-04	0.4811	0.0000	0.2279
26	2.60E-02	2.31E+00	4.83E-04	-5.13E-18	1.98E-04	0.4831	0.0000	0.1983
27	2.70E-02	2.28E+00	4.85E-04	-5.17E-18	1.69E-04	0.4852	0.0000	0.1688
28	2.80E-02	2.25E+00	4.87E-04	-5.14E-18	1.40E-04	0.4874	0.0000	0.1395
29	2.90E-02	2.23E+00	4.90E-04	-5.04E-18	1.10E-04	0.4898	0.0000	0.1104
30	3.00E-02	2.20E+00	4.92E-04	-4.79E-18	8.14E-05	0.4923	0.0000	0.0814
31	3.10E-02	2.18E+00	4.95E-04	-4.24E-18	5.27E-05	0.4950	0.0000	0.0527

Table C-3 The position of toner trajectory at the cone depth of dented electrode 1.0mm and the applied voltage 500V in unit (mm)

Step	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	1.71E-01	4.99E-04	-1.15E-19	1.06E-04	0.4988	0.0000	0.1061
2	2.00E-03	7.61E-01	4.96E-04	-6.45E-19	1.21E-04	0.4959	0.0000	0.1207
3	3.00E-03	7.87E-01	4.93E-04	-1.11E-18	1.38E-04	0.4927	0.0000	0.1377
4	4.00E-03	7.97E-01	4.90E-04	-1.38E-18	1.55E-04	0.4896	0.0000	0.1548
5	5.00E-03	8.08E-01	4.87E-04	-1.55E-18	1.72E-04	0.4866	0.0000	0.1721
6	6.00E-03	8.19E-01	4.84E-04	-1.65E-18	1.90E-04	0.4837	0.0000	0.1895
7	7.00E-03	8.31E-01	4.81E-04	-1.70E-18	2.07E-04	0.4809	0.0000	0.2071
8	8.00E-03	8.43E-01	4.78E-04	-1.72E-18	2.25E-04	0.4782	0.0000	0.2248
9	9.00E-03	8.55E-01	4.76E-04	-1.71E-18	2.43E-04	0.4756	0.0000	0.2426
10	1.00E-02	8.67E-01	4.73E-04	-1.67E-18	2.61E-04	0.4731	0.0000	0.2606
11	1.10E-02	8.80E-01	4.71E-04	-1.63E-18	2.79E-04	0.4706	0.0000	0.2788
12	1.20E-02	8.92E-01	4.68E-04	-1.56E-18	2.97E-04	0.4683	0.0000	0.2971
13	1.30E-02	9.05E-01	4.66E-04	-1.50E-18	3.15E-04	0.4660	0.0000	0.3155
14	1.40E-02	9.18E-01	4.64E-04	-1.50E-18	3.34E-04	0.4638	0.0000	0.3340
15	1.50E-02	9.30E-01	4.62E-04	-1.46E-18	3.53E-04	0.4617	0.0000	0.3527
16	1.60E-02	9.43E-01	4.60E-04	-1.43E-18	3.72E-04	0.4596	0.0000	0.3716
17	1.70E-02	9.56E-01	4.58E-04	-1.36E-18	3.91E-04	0.4576	0.0000	0.3905
18	1.80E-02	9.69E-01	4.56E-04	-1.27E-18	4.10E-04	0.4557	0.0000	0.4097
19	1.90E-02	9.82E-01	4.54E-04	-1.19E-18	4.29E-04	0.4539	0.0000	0.4289
20	2.00E-02	9.94E-01	4.52E-04	-1.13E-18	4.48E-04	0.4521	0.0000	0.4483
21	2.10E-02	1.01E+00	4.50E-04	-1.05E-18	4.68E-04	0.4503	0.0000	0.4678
22	2.20E-02	1.02E+00	4.49E-04	-9.63E-19	4.87E-04	0.4487	0.0000	0.4874
23	2.30E-02	1.03E+00	4.47E-04	-8.87E-19	5.07E-04	0.4470	0.0000	0.5072
24	2.40E-02	1.04E+00	4.45E-04	-8.15E-19	5.27E-04	0.4455	0.0000	0.5271

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
25	2.50E-02	1.06E+00	4.44E-04	-7.70E-19	5.47E-04	0.4440	0.0000	0.5471
26	2.60E-02	1.07E+00	4.43E-04	-7.34E-19	5.67E-04	0.4425	0.0000	0.5672
27	2.70E-02	1.08E+00	4.41E-04	-6.70E-19	5.87E-04	0.4411	0.0000	0.5874
28	2.80E-02	1.09E+00	4.40E-04	-5.84E-19	6.08E-04	0.4398	0.0000	0.6078
29	2.90E-02	1.10E+00	4.38E-04	-5.54E-19	6.28E-04	0.4384	0.0000	0.6283
30	3.00E-02	1.12E+00	4.37E-04	-4.98E-19	6.49E-04	0.4372	0.0000	0.6488
31	3.10E-02	1.13E+00	4.36E-04	-3.92E-19	6.70E-04	0.4360	0.0000	0.6695
32	3.20E-02	1.14E+00	4.35E-04	-3.00E-19	6.90E-04	0.4348	0.0000	0.6903
33	3.30E-02	1.15E+00	4.34E-04	-2.20E-19	7.11E-04	0.4336	0.0000	0.7112
34	3.40E-02	1.16E+00	4.33E-04	-1.34E-19	7.32E-04	0.4325	0.0000	0.7322
35	3.50E-02	1.17E+00	4.31E-04	-5.58E-20	7.53E-04	0.4315	0.0000	0.7533
36	3.60E-02	1.18E+00	4.30E-04	2.54E-20	7.74E-04	0.4305	0.0000	0.7745
37	3.70E-02	1.19E+00	4.30E-04	9.22E-20	7.96E-04	0.4295	0.0000	0.7957
38	3.80E-02	1.20E+00	4.29E-04	1.68E-19	8.17E-04	0.4286	0.0000	0.8171
39	3.90E-02	1.21E+00	4.28E-04	2.63E-19	8.39E-04	0.4277	0.0000	0.8386
40	4.00E-02	1.22E+00	4.27E-04	3.64E-19	8.60E-04	0.4268	0.0000	0.8601
41	4.10E-02	1.23E+00	4.26E-04	4.47E-19	8.82E-04	0.4260	0.0000	0.8817
42	4.20E-02	1.24E+00	4.25E-04	5.45E-19	9.03E-04	0.4252	0.0000	0.9034
43	4.30E-02	1.24E+00	4.24E-04	6.42E-19	9.25E-04	0.4244	0.0000	0.9252
44	4.40E-02	1.25E+00	4.24E-04	7.09E-19	9.47E-04	0.4237	0.0000	0.9470
45	4.50E-02	1.26E+00	4.23E-04	7.87E-19	9.69E-04	0.4230	0.0000	0.9689
46	4.60E-02	1.27E+00	4.22E-04	8.77E-19	9.91E-04	0.4223	0.0000	0.9909
47	4.70E-02	1.27E+00	4.22E-04	9.53E-19	1.01E-03	0.4217	0.0000	1.0129
48	4.80E-02	1.28E+00	4.21E-04	1.02E-18	1.04E-03	0.4211	0.0000	1.0350
49	4.90E-02	1.29E+00	4.20E-04	1.12E-18	1.06E-03	0.4205	0.0000	1.0572
50	5.00E-02	1.29E+00	4.20E-04	1.22E-18	1.08E-03	0.4199	0.0000	1.0794
51	5.10E-02	1.30E+00	4.19E-04	1.29E-18	1.10E-03	0.4194	0.0000	1.1017
52	5.20E-02	1.31E+00	4.19E-04	1.38E-18	1.12E-03	0.4190	0.0000	1.1240

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
53	5.30E-02	1.31E+00	4.18E-04	1.48E-18	1.15E-03	0.4185	0.0000	1.1464
54	5.40E-02	1.32E+00	4.18E-04	1.59E-18	1.17E-03	0.4181	0.0000	1.1688
55	5.50E-02	1.32E+00	4.18E-04	1.68E-18	1.19E-03	0.4177	0.0000	1.1913
56	5.60E-02	1.33E+00	4.17E-04	1.80E-18	1.21E-03	0.4173	0.0000	1.2138
57	5.70E-02	1.33E+00	4.17E-04	1.92E-18	1.24E-03	0.4170	0.0000	1.2363
58	5.80E-02	1.33E+00	4.17E-04	2.02E-18	1.26E-03	0.4167	0.0000	1.2589
59	5.90E-02	1.34E+00	4.16E-04	2.11E-18	1.28E-03	0.4164	0.0000	1.2815
60	6.00E-02	1.34E+00	4.16E-04	2.22E-18	1.30E-03	0.4161	0.0000	1.3041
61	6.10E-02	1.34E+00	4.16E-04	2.35E-18	1.33E-03	0.4159	0.0000	1.3268
62	6.20E-02	1.35E+00	4.16E-04	2.49E-18	1.35E-03	0.4157	0.0000	1.3494
63	6.30E-02	1.35E+00	4.16E-04	2.66E-18	1.37E-03	0.4155	0.0000	1.3721
64	6.40E-02	1.35E+00	4.15E-04	2.83E-18	1.39E-03	0.4154	0.0000	1.3948
65	6.50E-02	1.35E+00	4.15E-04	3.06E-18	1.42E-03	0.4153	0.0000	1.4176
66	6.60E-02	1.35E+00	4.15E-04	3.35E-18	1.44E-03	0.4152	0.0000	1.4403
67	6.70E-02	1.36E+00	4.15E-04	3.77E-18	1.46E-03	0.4151	0.0000	1.4631
68	6.80E-02	1.36E+00	4.15E-04	4.39E-18	1.49E-03	0.4151	0.0000	1.4858
69	6.90E-02	1.36E+00	4.15E-04	4.95E-18	1.50E-03	0.4151	0.0000	1.5000
1	1.00E-03	1.31E+00	4.15E-04	3.78E-18	1.47E-03	0.4151	0.0000	1.4688
2	2.00E-03	1.35E+00	4.15E-04	3.19E-18	1.45E-03	0.4151	0.0000	1.4461
3	3.00E-03	1.35E+00	4.15E-04	2.83E-18	1.42E-03	0.4152	0.0000	1.4234
4	4.00E-03	1.35E+00	4.15E-04	2.59E-18	1.40E-03	0.4153	0.0000	1.4007
5	5.00E-03	1.35E+00	4.15E-04	2.39E-18	1.38E-03	0.4154	0.0000	1.3779
6	6.00E-03	1.35E+00	4.16E-04	2.23E-18	1.36E-03	0.4155	0.0000	1.3552
7	7.00E-03	1.35E+00	4.16E-04	2.07E-18	1.33E-03	0.4157	0.0000	1.3325
8	8.00E-03	1.35E+00	4.16E-04	1.94E-18	1.31E-03	0.4159	0.0000	1.3099
9	9.00E-03	1.34E+00	4.16E-04	1.81E-18	1.29E-03	0.4162	0.0000	1.2872
10	1.00E-02	1.34E+00	4.16E-04	1.70E-18	1.26E-03	0.4164	0.0000	1.2646
11	1.10E-02	1.34E+00	4.17E-04	1.61E-18	1.24E-03	0.4167	0.0000	1.2420

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
12	1.20E-02	1.33E+00	4.17E-04	1.52E-18	1.22E-03	0.4170	0.0000	1.2194
13	1.30E-02	1.33E+00	4.17E-04	1.43E-18	1.20E-03	0.4174	0.0000	1.1969
14	1.40E-02	1.32E+00	4.18E-04	1.31E-18	1.17E-03	0.4178	0.0000	1.1744
15	1.50E-02	1.32E+00	4.18E-04	1.18E-18	1.15E-03	0.4182	0.0000	1.1520
16	1.60E-02	1.31E+00	4.19E-04	1.05E-18	1.13E-03	0.4186	0.0000	1.1296
17	1.70E-02	1.31E+00	4.19E-04	9.58E-19	1.11E-03	0.4190	0.0000	1.1072
18	1.80E-02	1.30E+00	4.20E-04	8.60E-19	1.08E-03	0.4195	0.0000	1.0849
19	1.90E-02	1.30E+00	4.20E-04	7.63E-19	1.06E-03	0.4201	0.0000	1.0626
20	2.00E-02	1.29E+00	4.21E-04	6.54E-19	1.04E-03	0.4206	0.0000	1.0404
21	2.10E-02	1.28E+00	4.21E-04	5.43E-19	1.02E-03	0.4212	0.0000	1.0183
22	2.20E-02	1.28E+00	4.22E-04	4.54E-19	9.96E-04	0.4218	0.0000	0.9962
23	2.30E-02	1.27E+00	4.22E-04	3.77E-19	9.74E-04	0.4224	0.0000	0.9742
24	2.40E-02	1.26E+00	4.23E-04	2.87E-19	9.52E-04	0.4231	0.0000	0.9522
25	2.50E-02	1.25E+00	4.24E-04	2.08E-19	9.30E-04	0.4238	0.0000	0.9303
26	2.60E-02	1.25E+00	4.25E-04	1.10E-19	9.08E-04	0.4246	0.0000	0.9085
27	2.70E-02	1.24E+00	4.25E-04	3.56E-20	8.87E-04	0.4253	0.0000	0.8867
28	2.80E-02	1.23E+00	4.26E-04	-3.95E-20	8.65E-04	0.4261	0.0000	0.8651
29	2.90E-02	1.22E+00	4.27E-04	-1.23E-19	8.43E-04	0.4270	0.0000	0.8435
30	3.00E-02	1.21E+00	4.28E-04	-2.23E-19	8.22E-04	0.4278	0.0000	0.8220
31	3.10E-02	1.20E+00	4.29E-04	-2.96E-19	8.01E-04	0.4288	0.0000	0.8005
32	3.20E-02	1.19E+00	4.30E-04	-3.73E-19	7.79E-04	0.4297	0.0000	0.7792
33	3.30E-02	1.18E+00	4.31E-04	-4.71E-19	7.58E-04	0.4307	0.0000	0.7580
34	3.40E-02	1.17E+00	4.32E-04	-5.62E-19	7.37E-04	0.4317	0.0000	0.7368
35	3.50E-02	1.16E+00	4.33E-04	-6.42E-19	7.16E-04	0.4328	0.0000	0.7157
36	3.60E-02	1.15E+00	4.34E-04	-7.17E-19	6.95E-04	0.4339	0.0000	0.6948
37	3.70E-02	1.14E+00	4.35E-04	-7.92E-19	6.74E-04	0.4350	0.0000	0.6739
38	3.80E-02	1.13E+00	4.36E-04	-8.54E-19	6.53E-04	0.4362	0.0000	0.6532
39	3.90E-02	1.12E+00	4.37E-04	-9.31E-19	6.32E-04	0.4375	0.0000	0.6325

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
68	6.80E-02	2.58E-04	4.97E-04	-1.21E-18	1.02E-04	0.4975	0.0000	0.1019
69	6.90E-02	7.40E-01	5.00E-04	-6.66E-19	8.94E-05	0.5000	0.0000	0.0894
70	7.00E-02	4.20E-04	5.01E-04	-6.03E-19	8.58E-05	0.5007	0.0000	0.0858
1	1.00E-03	7.41E-01	4.98E-04	-1.26E-18	1.14E-04	0.4982	0.0000	0.1145
2	2.00E-03	7.84E-01	4.95E-04	-1.78E-18	1.31E-04	0.4949	0.0000	0.1313
3	3.00E-03	7.94E-01	4.92E-04	-2.07E-18	1.48E-04	0.4918	0.0000	0.1484
4	4.00E-03	8.04E-01	4.89E-04	-2.25E-18	1.66E-04	0.4888	0.0000	0.1657
5	5.00E-03	8.16E-01	4.86E-04	-2.34E-18	1.83E-04	0.4858	0.0000	0.1830
6	6.00E-03	8.27E-01	4.83E-04	-2.36E-18	2.01E-04	0.4830	0.0000	0.2006
7	7.00E-03	8.39E-01	4.80E-04	-2.36E-18	2.18E-04	0.4802	0.0000	0.2182
8	8.00E-03	8.51E-01	4.78E-04	-2.34E-18	2.36E-04	0.4776	0.0000	0.2360
9	9.00E-03	8.63E-01	4.75E-04	-2.34E-18	2.54E-04	0.4750	0.0000	0.2540
10	1.00E-02	8.76E-01	4.73E-04	-2.28E-18	2.72E-04	0.4726	0.0000	0.2721
11	1.10E-02	8.88E-01	4.70E-04	-2.23E-18	2.90E-04	0.4702	0.0000	0.2903
12	1.20E-02	9.01E-01	4.68E-04	-2.17E-18	3.09E-04	0.4679	0.0000	0.3087
13	1.30E-02	9.13E-01	4.66E-04	-2.11E-18	3.27E-04	0.4656	0.0000	0.3272
14	1.40E-02	9.26E-01	4.63E-04	-2.09E-18	3.46E-04	0.4635	0.0000	0.3458
15	1.50E-02	9.39E-01	4.61E-04	-2.05E-18	3.65E-04	0.4614	0.0000	0.3646
16	1.60E-02	9.52E-01	4.59E-04	-1.99E-18	3.84E-04	0.4594	0.0000	0.3836
17	1.70E-02	9.65E-01	4.57E-04	-1.94E-18	4.03E-04	0.4574	0.0000	0.4026
18	1.80E-02	9.77E-01	4.56E-04	-1.89E-18	4.22E-04	0.4555	0.0000	0.4218
19	1.90E-02	9.90E-01	4.54E-04	-1.82E-18	4.41E-04	0.4537	0.0000	0.4412
20	2.00E-02	1.00E+00	4.52E-04	-1.76E-18	4.61E-04	0.4520	0.0000	0.4606
21	2.10E-02	1.02E+00	4.50E-04	-1.70E-18	4.80E-04	0.4503	0.0000	0.4802
22	2.20E-02	1.03E+00	4.49E-04	-1.64E-18	5.00E-04	0.4486	0.0000	0.4999
23	2.30E-02	1.04E+00	4.47E-04	-1.56E-18	5.20E-04	0.4470	0.0000	0.5198
24	2.40E-02	1.05E+00	4.46E-04	-1.48E-18	5.40E-04	0.4455	0.0000	0.5397
25	2.50E-02	1.06E+00	4.44E-04	-1.41E-18	5.60E-04	0.4440	0.0000	0.5598

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
54	5.40E-02	1.32E+00	4.19E-04	9.93E-19	1.18E-03	0.4188	0.0000	1.1831
55	5.50E-02	1.33E+00	4.18E-04	1.12E-18	1.21E-03	0.4184	0.0000	1.2056
56	5.60E-02	1.33E+00	4.18E-04	1.22E-18	1.23E-03	0.4180	0.0000	1.2281
57	5.70E-02	1.33E+00	4.18E-04	1.34E-18	1.25E-03	0.4177	0.0000	1.2507
58	5.80E-02	1.34E+00	4.17E-04	1.43E-18	1.27E-03	0.4174	0.0000	1.2732
59	5.90E-02	1.34E+00	4.17E-04	1.54E-18	1.30E-03	0.4172	0.0000	1.2959
60	6.00E-02	1.34E+00	4.17E-04	1.67E-18	1.32E-03	0.4169	0.0000	1.3185
61	6.10E-02	1.35E+00	4.17E-04	1.80E-18	1.34E-03	0.4167	0.0000	1.3412
62	6.20E-02	1.35E+00	4.17E-04	1.98E-18	1.36E-03	0.4165	0.0000	1.3639
63	6.30E-02	1.35E+00	4.16E-04	2.14E-18	1.39E-03	0.4164	0.0000	1.3866
64	6.40E-02	1.35E+00	4.16E-04	2.35E-18	1.41E-03	0.4162	0.0000	1.4093
65	6.50E-02	1.35E+00	4.16E-04	2.63E-18	1.43E-03	0.4161	0.0000	1.4320
66	6.60E-02	1.35E+00	4.16E-04	3.02E-18	1.45E-03	0.4161	0.0000	1.4548
67	6.70E-02	1.36E+00	4.16E-04	3.59E-18	1.48E-03	0.4160	0.0000	1.4775
68	6.80E-02	1.36E+00	4.16E-04	4.41E-18	1.50E-03	0.4161	0.0000	1.5000
1	1.00E-03	1.30E+00	4.16E-04	3.04E-18	1.46E-03	0.4160	0.0000	1.4605
2	2.00E-03	1.35E+00	4.16E-04	2.52E-18	1.44E-03	0.4161	0.0000	1.4379
3	3.00E-03	1.35E+00	4.16E-04	2.19E-18	1.42E-03	0.4162	0.0000	1.4151
4	4.00E-03	1.35E+00	4.16E-04	1.93E-18	1.39E-03	0.4163	0.0000	1.3924
5	5.00E-03	1.35E+00	4.16E-04	1.71E-18	1.37E-03	0.4164	0.0000	1.3697
6	6.00E-03	1.35E+00	4.17E-04	1.54E-18	1.35E-03	0.4166	0.0000	1.3470
7	7.00E-03	1.35E+00	4.17E-04	1.39E-18	1.32E-03	0.4168	0.0000	1.3243
8	8.00E-03	1.34E+00	4.17E-04	1.25E-18	1.30E-03	0.4170	0.0000	1.3016
9	9.00E-03	1.34E+00	4.17E-04	1.13E-18	1.28E-03	0.4172	0.0000	1.2790
10	1.00E-02	1.34E+00	4.17E-04	1.01E-18	1.26E-03	0.4175	0.0000	1.2564
11	1.10E-02	1.33E+00	4.18E-04	8.86E-19	1.23E-03	0.4178	0.0000	1.2338
12	1.20E-02	1.33E+00	4.18E-04	7.70E-19	1.21E-03	0.4181	0.0000	1.2112
13	1.30E-02	1.33E+00	4.18E-04	6.67E-19	1.19E-03	0.4185	0.0000	1.1887

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
14	1.40E-02	1.32E+00	4.19E-04	5.84E-19	1.17E-03	0.4189	0.0000	1.1663
15	1.50E-02	1.32E+00	4.19E-04	5.08E-19	1.14E-03	0.4193	0.0000	1.1438
16	1.60E-02	1.31E+00	4.20E-04	4.24E-19	1.12E-03	0.4197	0.0000	1.1214
17	1.70E-02	1.31E+00	4.20E-04	3.32E-19	1.10E-03	0.4202	0.0000	1.0991
18	1.80E-02	1.30E+00	4.21E-04	2.31E-19	1.08E-03	0.4207	0.0000	1.0768
19	1.90E-02	1.29E+00	4.21E-04	1.07E-19	1.05E-03	0.4212	0.0000	1.0545
20	2.00E-02	1.29E+00	4.22E-04	2.01E-20	1.03E-03	0.4218	0.0000	1.0324
21	2.10E-02	1.28E+00	4.22E-04	-6.73E-20	1.01E-03	0.4224	0.0000	1.0102
22	2.20E-02	1.27E+00	4.23E-04	-1.60E-19	9.88E-04	0.4230	0.0000	0.9882
23	2.30E-02	1.27E+00	4.24E-04	-2.53E-19	9.66E-04	0.4236	0.0000	0.9662
24	2.40E-02	1.26E+00	4.24E-04	-3.42E-19	9.44E-04	0.4243	0.0000	0.9442
25	2.50E-02	1.25E+00	4.25E-04	-4.32E-19	9.22E-04	0.4250	0.0000	0.9224
26	2.60E-02	1.24E+00	4.26E-04	-5.20E-19	9.01E-04	0.4258	0.0000	0.9006
27	2.70E-02	1.23E+00	4.27E-04	-6.13E-19	8.79E-04	0.4266	0.0000	0.8788
28	2.80E-02	1.23E+00	4.27E-04	-6.90E-19	8.57E-04	0.4274	0.0000	0.8572
29	2.90E-02	1.22E+00	4.28E-04	-7.45E-19	8.36E-04	0.4283	0.0000	0.8356
30	3.00E-02	1.21E+00	4.29E-04	-8.21E-19	8.14E-04	0.4292	0.0000	0.8141
31	3.10E-02	1.20E+00	4.30E-04	-8.94E-19	7.93E-04	0.4301	0.0000	0.7927
32	3.20E-02	1.19E+00	4.31E-04	-9.38E-19	7.71E-04	0.4310	0.0000	0.7714
33	3.30E-02	1.18E+00	4.32E-04	-9.84E-19	7.50E-04	0.4320	0.0000	0.7502
34	3.40E-02	1.17E+00	4.33E-04	-1.07E-18	7.29E-04	0.4331	0.0000	0.7291
35	3.50E-02	1.16E+00	4.34E-04	-1.13E-18	7.08E-04	0.4342	0.0000	0.7081
36	3.60E-02	1.15E+00	4.35E-04	-1.21E-18	6.87E-04	0.4353	0.0000	0.6871
37	3.70E-02	1.14E+00	4.36E-04	-1.29E-18	6.66E-04	0.4365	0.0000	0.6663
38	3.80E-02	1.13E+00	4.38E-04	-1.38E-18	6.46E-04	0.4377	0.0000	0.6456
39	3.90E-02	1.11E+00	4.39E-04	-1.49E-18	6.25E-04	0.4389	0.0000	0.6250
40	4.00E-02	1.10E+00	4.40E-04	-1.60E-18	6.04E-04	0.4402	0.0000	0.6045
41	4.10E-02	1.09E+00	4.42E-04	-1.67E-18	5.84E-04	0.4415	0.0000	0.5841

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
42	4.20E-02	1.08E+00	4.43E-04	-1.76E-18	5.64E-04	0.4429	0.0000	0.5638
43	4.30E-02	1.07E+00	4.44E-04	-1.85E-18	5.44E-04	0.4444	0.0000	0.5436
44	4.40E-02	1.06E+00	4.46E-04	-1.94E-18	5.24E-04	0.4459	0.0000	0.5236
45	4.50E-02	1.04E+00	4.47E-04	-2.04E-18	5.04E-04	0.4474	0.0000	0.5036
46	4.60E-02	1.03E+00	4.49E-04	-2.14E-18	4.84E-04	0.4490	0.0000	0.4838
47	4.70E-02	1.02E+00	4.51E-04	-2.22E-18	4.64E-04	0.4507	0.0000	0.4642
48	4.80E-02	1.01E+00	4.52E-04	-2.28E-18	4.45E-04	0.4524	0.0000	0.4446
49	4.90E-02	9.92E-01	4.54E-04	-2.34E-18	4.25E-04	0.4541	0.0000	0.4252
50	5.00E-02	9.80E-01	4.56E-04	-2.38E-18	4.06E-04	0.4560	0.0000	0.4059
51	5.10E-02	9.67E-01	4.58E-04	-2.44E-18	3.87E-04	0.4579	0.0000	0.3868
52	5.20E-02	9.54E-01	4.60E-04	-2.50E-18	3.68E-04	0.4598	0.0000	0.3677
53	5.30E-02	9.41E-01	4.62E-04	-2.54E-18	3.49E-04	0.4619	0.0000	0.3489
54	5.40E-02	9.28E-01	4.64E-04	-2.57E-18	3.30E-04	0.4640	0.0000	0.3301
55	5.50E-02	9.15E-01	4.66E-04	-2.63E-18	3.12E-04	0.4662	0.0000	0.3115
56	5.60E-02	9.03E-01	4.68E-04	-2.68E-18	2.93E-04	0.4684	0.0000	0.2931
57	5.70E-02	8.90E-01	4.71E-04	-2.74E-18	2.75E-04	0.4707	0.0000	0.2747
58	5.80E-02	8.77E-01	4.73E-04	-2.80E-18	2.57E-04	0.4732	0.0000	0.2566
59	5.90E-02	8.65E-01	4.76E-04	-2.85E-18	2.39E-04	0.4757	0.0000	0.2385
60	6.00E-02	8.52E-01	4.78E-04	-2.86E-18	2.21E-04	0.4782	0.0000	0.2206
61	6.10E-02	8.40E-01	4.81E-04	-2.85E-18	2.03E-04	0.4809	0.0000	0.2029
62	6.20E-02	8.28E-01	4.84E-04	-2.82E-18	1.85E-04	0.4837	0.0000	0.1853
63	6.30E-02	8.17E-01	4.87E-04	-2.74E-18	1.68E-04	0.4866	0.0000	0.1678
64	6.40E-02	8.05E-01	4.90E-04	-2.61E-18	1.51E-04	0.4895	0.0000	0.1505
65	6.50E-02	7.94E-01	4.93E-04	-2.38E-18	1.33E-04	0.4926	0.0000	0.1333
66	6.60E-02	7.85E-01	4.96E-04	-2.02E-18	1.16E-04	0.4958	0.0000	0.1163
67	6.70E-02	7.75E-01	4.99E-04	-1.40E-18	9.94E-05	0.4990	0.0000	0.0994
68	6.80E-02	3.45E-04	5.00E-04	-1.46E-18	9.56E-05	0.4998	0.0000	0.0956
69	6.90E-02	1.18E-03	5.00E-04	-1.93E-18	9.62E-05	0.4997	0.0000	0.0962

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
70	7.00E-02	1.17E-03	5.00E-04	-2.45E-18	9.69E-05	0.4996	0.0000	0.0969
1	1.00E-03	7.50E-01	4.93E-04	-2.42E-18	1.29E-04	0.4933	0.0000	0.1290
2	2.00E-03	7.91E-01	4.90E-04	-2.77E-18	1.46E-04	0.4902	0.0000	0.1460
3	3.00E-03	8.02E-01	4.87E-04	-2.97E-18	1.63E-04	0.4871	0.0000	0.1632
4	4.00E-03	8.13E-01	4.84E-04	-3.05E-18	1.81E-04	0.4842	0.0000	0.1805
5	5.00E-03	8.24E-01	4.81E-04	-3.11E-18	1.98E-04	0.4814	0.0000	0.1980
6	6.00E-03	8.36E-01	4.79E-04	-3.13E-18	2.16E-04	0.4786	0.0000	0.2156
7	7.00E-03	8.48E-01	4.76E-04	-3.13E-18	2.33E-04	0.4760	0.0000	0.2334
8	8.00E-03	8.61E-01	4.73E-04	-3.14E-18	2.51E-04	0.4734	0.0000	0.2513
9	9.00E-03	8.73E-01	4.71E-04	-3.13E-18	2.69E-04	0.4709	0.0000	0.2694
10	1.00E-02	8.85E-01	4.69E-04	-3.09E-18	2.88E-04	0.4685	0.0000	0.2876
11	1.10E-02	8.98E-01	4.66E-04	-3.04E-18	3.06E-04	0.4662	0.0000	0.3059
12	1.20E-02	9.11E-01	4.64E-04	-3.01E-18	3.24E-04	0.4640	0.0000	0.3244
13	1.30E-02	9.23E-01	4.62E-04	-2.96E-18	3.43E-04	0.4618	0.0000	0.3430
14	1.40E-02	9.36E-01	4.60E-04	-2.91E-18	3.62E-04	0.4597	0.0000	0.3618
15	1.50E-02	9.49E-01	4.58E-04	-2.83E-18	3.81E-04	0.4577	0.0000	0.3807
16	1.60E-02	9.62E-01	4.56E-04	-2.77E-18	4.00E-04	0.4557	0.0000	0.3997
17	1.70E-02	9.75E-01	4.54E-04	-2.71E-18	4.19E-04	0.4539	0.0000	0.4189
18	1.80E-02	9.87E-01	4.52E-04	-2.65E-18	4.38E-04	0.4520	0.0000	0.4382
19	1.90E-02	1.00E+00	4.50E-04	-2.61E-18	4.58E-04	0.4503	0.0000	0.4576
20	2.00E-02	1.01E+00	4.49E-04	-2.54E-18	4.77E-04	0.4486	0.0000	0.4772
21	2.10E-02	1.03E+00	4.47E-04	-2.49E-18	4.97E-04	0.4469	0.0000	0.4969
22	2.20E-02	1.04E+00	4.45E-04	-2.40E-18	5.17E-04	0.4453	0.0000	0.5167
23	2.30E-02	1.05E+00	4.44E-04	-2.34E-18	5.37E-04	0.4438	0.0000	0.5367
24	2.40E-02	1.06E+00	4.42E-04	-2.31E-18	5.57E-04	0.4423	0.0000	0.5567
25	2.50E-02	1.07E+00	4.41E-04	-2.25E-18	5.77E-04	0.4409	0.0000	0.5769
26	2.60E-02	1.09E+00	4.40E-04	-2.19E-18	5.97E-04	0.4395	0.0000	0.5972
27	2.70E-02	1.10E+00	4.38E-04	-2.09E-18	6.18E-04	0.4382	0.0000	0.6176

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
28	2.80E-02	1.11E+00	4.37E-04	-1.99E-18	6.38E-04	0.4369	0.0000	0.6381
29	2.90E-02	1.12E+00	4.36E-04	-1.90E-18	6.59E-04	0.4357	0.0000	0.6588
30	3.00E-02	1.13E+00	4.34E-04	-1.82E-18	6.79E-04	0.4345	0.0000	0.6795
31	3.10E-02	1.14E+00	4.33E-04	-1.74E-18	7.00E-04	0.4333	0.0000	0.7003
32	3.20E-02	1.15E+00	4.32E-04	-1.66E-18	7.21E-04	0.4322	0.0000	0.7213
33	3.30E-02	1.16E+00	4.31E-04	-1.59E-18	7.42E-04	0.4311	0.0000	0.7423
34	3.40E-02	1.17E+00	4.30E-04	-1.49E-18	7.63E-04	0.4301	0.0000	0.7634
35	3.50E-02	1.18E+00	4.29E-04	-1.41E-18	7.85E-04	0.4291	0.0000	0.7847
36	3.60E-02	1.19E+00	4.28E-04	-1.33E-18	8.06E-04	0.4281	0.0000	0.8060
37	3.70E-02	1.20E+00	4.27E-04	-1.26E-18	8.27E-04	0.4272	0.0000	0.8274
38	3.80E-02	1.21E+00	4.26E-04	-1.20E-18	8.49E-04	0.4263	0.0000	0.8489
39	3.90E-02	1.22E+00	4.25E-04	-1.12E-18	8.70E-04	0.4255	0.0000	0.8704
40	4.00E-02	1.23E+00	4.25E-04	-1.05E-18	8.92E-04	0.4247	0.0000	0.8921
41	4.10E-02	1.24E+00	4.24E-04	-1.00E-18	9.14E-04	0.4239	0.0000	0.9138
42	4.20E-02	1.25E+00	4.23E-04	-9.35E-19	9.36E-04	0.4231	0.0000	0.9356
43	4.30E-02	1.26E+00	4.22E-04	-8.80E-19	9.57E-04	0.4224	0.0000	0.9575
44	4.40E-02	1.26E+00	4.22E-04	-7.94E-19	9.79E-04	0.4217	0.0000	0.9794
45	4.50E-02	1.27E+00	4.21E-04	-7.08E-19	1.00E-03	0.4211	0.0000	1.0014
46	4.60E-02	1.28E+00	4.20E-04	-6.23E-19	1.02E-03	0.4205	0.0000	1.0235
47	4.70E-02	1.28E+00	4.20E-04	-5.59E-19	1.05E-03	0.4199	0.0000	1.0456
48	4.80E-02	1.29E+00	4.19E-04	-4.50E-19	1.07E-03	0.4193	0.0000	1.0678
49	4.90E-02	1.30E+00	4.19E-04	-3.66E-19	1.09E-03	0.4188	0.0000	1.0901
50	5.00E-02	1.30E+00	4.18E-04	-2.59E-19	1.11E-03	0.4183	0.0000	1.1124
51	5.10E-02	1.31E+00	4.18E-04	-1.46E-19	1.13E-03	0.4178	0.0000	1.1347
52	5.20E-02	1.31E+00	4.17E-04	-3.70E-20	1.16E-03	0.4174	0.0000	1.1571
53	5.30E-02	1.32E+00	4.17E-04	6.60E-20	1.18E-03	0.4170	0.0000	1.1795
54	5.40E-02	1.32E+00	4.17E-04	1.85E-19	1.20E-03	0.4166	0.0000	1.2020
55	5.50E-02	1.33E+00	4.16E-04	2.93E-19	1.22E-03	0.4163	0.0000	1.2245

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
56	5.60E-02	1.33E+00	4.16E-04	3.86E-19	1.25E-03	0.4159	0.0000	1.2471
57	5.70E-02	1.34E+00	4.16E-04	5.07E-19	1.27E-03	0.4156	0.0000	1.2697
58	5.80E-02	1.34E+00	4.15E-04	6.43E-19	1.29E-03	0.4154	0.0000	1.2923
59	5.90E-02	1.34E+00	4.15E-04	8.02E-19	1.31E-03	0.4151	0.0000	1.3149
60	6.00E-02	1.35E+00	4.15E-04	9.27E-19	1.34E-03	0.4149	0.0000	1.3376
61	6.10E-02	1.35E+00	4.15E-04	1.04E-18	1.36E-03	0.4147	0.0000	1.3603
62	6.20E-02	1.35E+00	4.15E-04	1.19E-18	1.38E-03	0.4146	0.0000	1.3830
63	6.30E-02	1.35E+00	4.14E-04	1.38E-18	1.41E-03	0.4144	0.0000	1.4057
64	6.40E-02	1.35E+00	4.14E-04	1.62E-18	1.43E-03	0.4143	0.0000	1.4284
65	6.50E-02	1.35E+00	4.14E-04	1.95E-18	1.45E-03	0.4143	0.0000	1.4512
66	6.60E-02	1.36E+00	4.14E-04	2.47E-18	1.47E-03	0.4142	0.0000	1.4739
67	6.70E-02	1.36E+00	4.14E-04	3.27E-18	1.50E-03	0.4142	0.0000	1.4967
68	6.80E-02	9.28E-03	4.14E-04	4.03E-18	1.50E-03	0.4143	0.0000	1.5000
1	1.00E-03	1.31E+00	4.14E-04	2.56E-18	1.48E-03	0.4142	0.0000	1.4796
2	2.00E-03	1.35E+00	4.14E-04	1.87E-18	1.46E-03	0.4142	0.0000	1.4570
3	3.00E-03	1.35E+00	4.14E-04	1.40E-18	1.43E-03	0.4142	0.0000	1.4342
4	4.00E-03	1.35E+00	4.14E-04	1.09E-18	1.41E-03	0.4143	0.0000	1.4115
5	5.00E-03	1.35E+00	4.14E-04	8.56E-19	1.39E-03	0.4144	0.0000	1.3888
6	6.00E-03	1.35E+00	4.15E-04	6.65E-19	1.37E-03	0.4146	0.0000	1.3661
7	7.00E-03	1.35E+00	4.15E-04	5.02E-19	1.34E-03	0.4147	0.0000	1.3434
8	8.00E-03	1.35E+00	4.15E-04	3.67E-19	1.32E-03	0.4149	0.0000	1.3207
9	9.00E-03	1.34E+00	4.15E-04	2.53E-19	1.30E-03	0.4151	0.0000	1.2980
10	1.00E-02	1.34E+00	4.15E-04	1.63E-19	1.28E-03	0.4154	0.0000	1.2754
11	1.10E-02	1.34E+00	4.16E-04	3.77E-20	1.25E-03	0.4157	0.0000	1.2528
12	1.20E-02	1.33E+00	4.16E-04	-7.47E-20	1.23E-03	0.4160	0.0000	1.2302
13	1.30E-02	1.33E+00	4.16E-04	-1.85E-19	1.21E-03	0.4163	0.0000	1.2077
14	1.40E-02	1.33E+00	4.17E-04	-2.68E-19	1.19E-03	0.4167	0.0000	1.1852
15	1.50E-02	1.32E+00	4.17E-04	-3.51E-19	1.16E-03	0.4170	0.0000	1.1627

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
16	1.60E-02	1.32E+00	4.17E-04	-4.60E-19	1.14E-03	0.4175	0.0000	1.1403
17	1.70E-02	1.31E+00	4.18E-04	-5.99E-19	1.12E-03	0.4179	0.0000	1.1179
18	1.80E-02	1.31E+00	4.18E-04	-7.17E-19	1.10E-03	0.4184	0.0000	1.0956
19	1.90E-02	1.30E+00	4.19E-04	-8.14E-19	1.07E-03	0.4189	0.0000	1.0733
20	2.00E-02	1.29E+00	4.19E-04	-8.79E-19	1.05E-03	0.4194	0.0000	1.0510
21	2.10E-02	1.29E+00	4.20E-04	-9.67E-19	1.03E-03	0.4200	0.0000	1.0289
22	2.20E-02	1.28E+00	4.21E-04	-1.07E-18	1.01E-03	0.4206	0.0000	1.0067
23	2.30E-02	1.27E+00	4.21E-04	-1.15E-18	9.85E-04	0.4212	0.0000	0.9847
24	2.40E-02	1.27E+00	4.22E-04	-1.24E-18	9.63E-04	0.4219	0.0000	0.9627
25	2.50E-02	1.26E+00	4.23E-04	-1.31E-18	9.41E-04	0.4226	0.0000	0.9408
26	2.60E-02	1.25E+00	4.23E-04	-1.40E-18	9.19E-04	0.4233	0.0000	0.9189
27	2.70E-02	1.24E+00	4.24E-04	-1.47E-18	8.97E-04	0.4240	0.0000	0.8971
28	2.80E-02	1.23E+00	4.25E-04	-1.54E-18	8.75E-04	0.4248	0.0000	0.8754
29	2.90E-02	1.22E+00	4.26E-04	-1.63E-18	8.54E-04	0.4256	0.0000	0.8538
30	3.00E-02	1.22E+00	4.26E-04	-1.69E-18	8.32E-04	0.4265	0.0000	0.8323
31	3.10E-02	1.21E+00	4.27E-04	-1.78E-18	8.11E-04	0.4274	0.0000	0.8108
32	3.20E-02	1.20E+00	4.28E-04	-1.87E-18	7.89E-04	0.4283	0.0000	0.7894
33	3.30E-02	1.19E+00	4.29E-04	-1.95E-18	7.68E-04	0.4293	0.0000	0.7681
34	3.40E-02	1.18E+00	4.30E-04	-2.02E-18	7.47E-04	0.4303	0.0000	0.7469
35	3.50E-02	1.17E+00	4.31E-04	-2.06E-18	7.26E-04	0.4313	0.0000	0.7258
36	3.60E-02	1.16E+00	4.32E-04	-2.11E-18	7.05E-04	0.4324	0.0000	0.7048
37	3.70E-02	1.15E+00	4.34E-04	-2.19E-18	6.84E-04	0.4335	0.0000	0.6839
38	3.80E-02	1.13E+00	4.35E-04	-2.29E-18	6.63E-04	0.4347	0.0000	0.6631
39	3.90E-02	1.12E+00	4.36E-04	-2.33E-18	6.42E-04	0.4359	0.0000	0.6424
40	4.00E-02	1.11E+00	4.37E-04	-2.38E-18	6.22E-04	0.4372	0.0000	0.6218
41	4.10E-02	1.10E+00	4.38E-04	-2.44E-18	6.01E-04	0.4385	0.0000	0.6013
42	4.20E-02	1.09E+00	4.40E-04	-2.51E-18	5.81E-04	0.4398	0.0000	0.5809
43	4.30E-02	1.08E+00	4.41E-04	-2.60E-18	5.61E-04	0.4412	0.0000	0.5607

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
44	4.40E-02	1.06E+00	4.43E-04	-2.68E-18	5.41E-04	0.4426	0.0000	0.5405
45	4.50E-02	1.05E+00	4.44E-04	-2.76E-18	5.20E-04	0.4441	0.0000	0.5205
46	4.60E-02	1.04E+00	4.46E-04	-2.85E-18	5.01E-04	0.4457	0.0000	0.5006
47	4.70E-02	1.03E+00	4.47E-04	-2.92E-18	4.81E-04	0.4473	0.0000	0.4808
48	4.80E-02	1.02E+00	4.49E-04	-2.99E-18	4.61E-04	0.4489	0.0000	0.4612
49	4.90E-02	1.00E+00	4.51E-04	-3.05E-18	4.42E-04	0.4506	0.0000	0.4416
50	5.00E-02	9.90E-01	4.52E-04	-3.13E-18	4.22E-04	0.4524	0.0000	0.4222
51	5.10E-02	9.77E-01	4.54E-04	-3.23E-18	4.03E-04	0.4543	0.0000	0.4030
52	5.20E-02	9.64E-01	4.56E-04	-3.31E-18	3.84E-04	0.4562	0.0000	0.3839
53	5.30E-02	9.51E-01	4.58E-04	-3.36E-18	3.65E-04	0.4581	0.0000	0.3649
54	5.40E-02	9.38E-01	4.60E-04	-3.44E-18	3.46E-04	0.4602	0.0000	0.3460
55	5.50E-02	9.26E-01	4.62E-04	-3.50E-18	3.27E-04	0.4623	0.0000	0.3273
56	5.60E-02	9.13E-01	4.64E-04	-3.53E-18	3.09E-04	0.4645	0.0000	0.3087
57	5.70E-02	9.00E-01	4.67E-04	-3.57E-18	2.90E-04	0.4667	0.0000	0.2903
58	5.80E-02	8.87E-01	4.69E-04	-3.60E-18	2.72E-04	0.4691	0.0000	0.2720
59	5.90E-02	8.75E-01	4.71E-04	-3.65E-18	2.54E-04	0.4715	0.0000	0.2539
60	6.00E-02	8.62E-01	4.74E-04	-3.70E-18	2.36E-04	0.4740	0.0000	0.2359
61	6.10E-02	8.50E-01	4.77E-04	-3.74E-18	2.18E-04	0.4766	0.0000	0.2180
62	6.20E-02	8.37E-01	4.79E-04	-3.76E-18	2.00E-04	0.4793	0.0000	0.2003
63	6.30E-02	8.26E-01	4.82E-04	-3.71E-18	1.83E-04	0.4820	0.0000	0.1827
64	6.40E-02	8.14E-01	4.85E-04	-3.65E-18	1.65E-04	0.4849	0.0000	0.1653
65	6.50E-02	8.02E-01	4.88E-04	-3.54E-18	1.48E-04	0.4879	0.0000	0.1480
66	6.60E-02	7.92E-01	4.91E-04	-3.33E-18	1.31E-04	0.4909	0.0000	0.1309
67	6.70E-02	7.82E-01	4.94E-04	-2.95E-18	1.14E-04	0.4941	0.0000	0.1138
68	6.80E-02	7.72E-01	4.97E-04	-2.24E-18	9.70E-05	0.4974	0.0000	0.0970
69	6.90E-02	3.60E-04	4.98E-04	-2.28E-18	9.32E-05	0.4982	0.0000	0.0932
70	7.00E-02	1.23E-03	4.98E-04	-2.71E-18	9.38E-05	0.4981	0.0000	0.0938

Table C-4 The position of toner trajectory at the cone depth of dented electrode 0.2mm and the applied voltage 750V in unit (mm)

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	2.47E+00	4.99E-04	-5.68E-19	4.34E-05	0.4991	0.0000	0.0434
2	2.00E-03	1.04E+01	4.97E-04	-1.23E-18	9.87E-05	0.4970	0.0000	0.0987
3	3.00E-03	1.07E+01	4.95E-04	-1.48E-18	1.62E-04	0.4950	0.0000	0.1623
4	4.00E-03	1.08E+01	4.93E-04	-1.46E-18	2.26E-04	0.4933	0.0000	0.2264
5	5.00E-03	1.09E+01	4.92E-04	-1.37E-18	2.91E-04	0.4919	0.0000	0.2908
6	6.00E-03	1.10E+01	4.91E-04	-1.25E-18	3.55E-04	0.4907	0.0000	0.3554
7	7.00E-03	1.10E+01	4.90E-04	-1.10E-18	4.20E-04	0.4898	0.0000	0.4202
8	8.00E-03	1.11E+01	4.89E-04	-9.56E-19	4.85E-04	0.4890	0.0000	0.4852
9	9.00E-03	1.11E+01	4.89E-04	-7.21E-19	5.50E-04	0.4885	0.0000	0.5503
10	1.00E-02	1.11E+01	4.88E-04	-3.27E-19	6.16E-04	0.4881	0.0000	0.6155
11	1.10E-02	1.12E+01	4.88E-04	6.15E-19	6.81E-04	0.4879	0.0000	0.6808
12	1.20E-02	1.27E-02	4.88E-04	2.43E-18	6.95E-04	0.4879	0.0000	0.6946
1	1.00E-03	1.07E+01	4.88E-04	8.20E-19	6.46E-04	0.4879	0.0000	0.6458
2	2.00E-03	1.11E+01	4.88E-04	-1.99E-19	5.81E-04	0.4881	0.0000	0.5808
3	3.00E-03	1.11E+01	4.88E-04	-6.02E-19	5.16E-04	0.4885	0.0000	0.5156
4	4.00E-03	1.11E+01	4.89E-04	-8.91E-19	4.51E-04	0.4890	0.0000	0.4505
5	5.00E-03	1.10E+01	4.90E-04	-1.11E-18	3.86E-04	0.4898	0.0000	0.3855
6	6.00E-03	1.10E+01	4.91E-04	-1.25E-18	3.21E-04	0.4907	0.0000	0.3207
7	7.00E-03	1.09E+01	4.92E-04	-1.35E-18	2.56E-04	0.4919	0.0000	0.2561
8	8.00E-03	1.08E+01	4.93E-04	-1.38E-18	1.92E-04	0.4933	0.0000	0.1917
9	9.00E-03	1.07E+01	4.95E-04	-1.33E-18	1.28E-04	0.4950	0.0000	0.1276
10	1.00E-02	1.06E+01	4.97E-04	-1.15E-18	6.39E-05	0.4970	0.0000	0.0639
1	1.00E-03	1.02E+01	4.95E-04	-1.56E-18	1.11E-04	0.4954	0.0000	0.1114
2	2.00E-03	1.07E+01	4.93E-04	-1.79E-18	1.75E-04	0.4934	0.0000	0.1749

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
3	3.00E-03	1.08E+01	4.92E-04	-1.81E-18	2.39E-04	0.4918	0.0000	0.2391
4	4.00E-03	1.09E+01	4.90E-04	-1.72E-18	3.04E-04	0.4904	0.0000	0.3035
5	5.00E-03	1.10E+01	4.89E-04	-1.59E-18	3.68E-04	0.4893	0.0000	0.3682
6	6.00E-03	1.10E+01	4.88E-04	-1.44E-18	4.33E-04	0.4884	0.0000	0.4330
7	7.00E-03	1.11E+01	4.88E-04	-1.31E-18	4.98E-04	0.4877	0.0000	0.4980
8	8.00E-03	1.11E+01	4.87E-04	-1.10E-18	5.63E-04	0.4872	0.0000	0.5631
9	9.00E-03	1.11E+01	4.87E-04	-6.51E-19	6.28E-04	0.4868	0.0000	0.6284
10	1.00E-02	1.12E+01	4.87E-04	5.69E-19	6.94E-04	0.4867	0.0000	0.6937
1	1.00E-03	1.07E+01	4.87E-04	-1.10E-18	6.45E-04	0.4867	0.0000	0.6448
2	2.00E-03	1.11E+01	4.87E-04	-2.12E-18	5.80E-04	0.4869	0.0000	0.5799
3	3.00E-03	1.11E+01	4.87E-04	-2.52E-18	5.15E-04	0.4873	0.0000	0.5147
4	4.00E-03	1.11E+01	4.88E-04	-2.72E-18	4.50E-04	0.4878	0.0000	0.4495
5	5.00E-03	1.10E+01	4.89E-04	-2.90E-18	3.85E-04	0.4886	0.0000	0.3846
6	6.00E-03	1.10E+01	4.90E-04	-3.06E-18	3.20E-04	0.4895	0.0000	0.3198
7	7.00E-03	1.09E+01	4.91E-04	-3.17E-18	2.55E-04	0.4907	0.0000	0.2552
8	8.00E-03	1.08E+01	4.92E-04	-3.25E-18	1.91E-04	0.4921	0.0000	0.1908
9	9.00E-03	1.07E+01	4.94E-04	-3.27E-18	1.27E-04	0.4938	0.0000	0.1267
10	1.00E-02	1.06E+01	4.96E-04	-3.07E-18	6.29E-05	0.4959	0.0000	0.0629
1	1.00E-03	1.02E+01	4.94E-04	-3.47E-18	1.10E-04	0.4942	0.0000	0.1105
2	2.00E-03	1.07E+01	4.92E-04	-3.63E-18	1.74E-04	0.4922	0.0000	0.1740
3	3.00E-03	1.08E+01	4.91E-04	-3.63E-18	2.38E-04	0.4906	0.0000	0.2381
4	4.00E-03	1.09E+01	4.89E-04	-3.58E-18	3.03E-04	0.4892	0.0000	0.3026
5	5.00E-03	1.10E+01	4.88E-04	-3.51E-18	3.67E-04	0.4881	0.0000	0.3672
6	6.00E-03	1.10E+01	4.87E-04	-3.32E-18	4.32E-04	0.4872	0.0000	0.4320
7	7.00E-03	1.11E+01	4.86E-04	-3.10E-18	4.97E-04	0.4865	0.0000	0.4970
8	8.00E-03	1.11E+01	4.86E-04	-2.83E-18	5.62E-04	0.4860	0.0000	0.5622
9	9.00E-03	1.11E+01	4.86E-04	-2.35E-18	6.27E-04	0.4857	0.0000	0.6274
10	1.00E-02	1.12E+01	4.85E-04	-1.22E-18	6.93E-04	0.4855	0.0000	0.6927

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	1.07E+01	4.86E-04	-2.91E-18	6.44E-04	0.4855	0.0000	0.6438
2	2.00E-03	1.11E+01	4.86E-04	-3.95E-18	5.79E-04	0.4857	0.0000	0.5789
3	3.00E-03	1.11E+01	4.86E-04	-4.37E-18	5.14E-04	0.4861	0.0000	0.5137
4	4.00E-03	1.11E+01	4.87E-04	-4.61E-18	4.49E-04	0.4867	0.0000	0.4486
5	5.00E-03	1.10E+01	4.87E-04	-4.79E-18	3.84E-04	0.4874	0.0000	0.3836
6	6.00E-03	1.10E+01	4.88E-04	-4.96E-18	3.19E-04	0.4884	0.0000	0.3188
7	7.00E-03	1.09E+01	4.90E-04	-5.07E-18	2.54E-04	0.4895	0.0000	0.2542
8	8.00E-03	1.08E+01	4.91E-04	-5.14E-18	1.90E-04	0.4910	0.0000	0.1899
9	9.00E-03	1.07E+01	4.93E-04	-5.11E-18	1.26E-04	0.4927	0.0000	0.1258
10	1.00E-02	1.06E+01	4.95E-04	-4.92E-18	6.20E-05	0.4947	0.0000	0.0620

Table C-5 The position of toner trajectory at the cone depth of dented electrode 0.5mm and the applied voltage 750V in unit (mm)

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	1.13E+00	4.98E-04	-3.63E-19	6.58E-05	0.4984	0.0000	0.0658
2	2.00E-03	4.83E+00	4.95E-04	-1.01E-18	1.03E-04	0.4948	0.0000	0.1033
3	3.00E-03	5.02E+00	4.91E-04	-1.32E-18	1.47E-04	0.4911	0.0000	0.1467
4	4.00E-03	5.10E+00	4.88E-04	-1.40E-18	1.91E-04	0.4877	0.0000	0.1907
5	5.00E-03	5.19E+00	4.85E-04	-1.39E-18	2.35E-04	0.4846	0.0000	0.2350
6	6.00E-03	5.27E+00	4.82E-04	-1.33E-18	2.80E-04	0.4818	0.0000	0.2797
7	7.00E-03	5.35E+00	4.79E-04	-1.23E-18	3.25E-04	0.4793	0.0000	0.3248
8	8.00E-03	5.43E+00	4.77E-04	-1.13E-18	3.70E-04	0.4770	0.0000	0.3702
9	9.00E-03	5.51E+00	4.75E-04	-1.03E-18	4.16E-04	0.4750	0.0000	0.4159
10	1.00E-02	5.57E+00	4.73E-04	-9.14E-19	4.62E-04	0.4732	0.0000	0.4620
11	1.10E-02	5.64E+00	4.72E-04	-8.00E-19	5.08E-04	0.4715	0.0000	0.5083
12	1.20E-02	5.70E+00	4.70E-04	-6.88E-19	5.55E-04	0.4701	0.0000	0.5549

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
13	1.30E-02	5.75E+00	4.69E-04	-5.52E-19	6.02E-04	0.4688	0.0000	0.6017
14	1.40E-02	5.80E+00	4.68E-04	-4.35E-19	6.49E-04	0.4677	0.0000	0.6487
15	1.50E-02	5.84E+00	4.67E-04	-2.89E-19	6.96E-04	0.4667	0.0000	0.6959
16	1.60E-02	5.88E+00	4.66E-04	-1.28E-19	7.43E-04	0.4659	0.0000	0.7432
17	1.70E-02	5.91E+00	4.65E-04	3.25E-20	7.91E-04	0.4652	0.0000	0.7907
18	1.80E-02	5.94E+00	4.65E-04	2.82E-19	8.38E-04	0.4647	0.0000	0.8383
19	1.90E-02	5.96E+00	4.64E-04	5.57E-19	8.86E-04	0.4643	0.0000	0.8860
20	2.00E-02	5.97E+00	4.64E-04	9.72E-19	9.34E-04	0.4640	0.0000	0.9338
21	2.10E-02	5.99E+00	4.64E-04	1.81E-18	9.82E-04	0.4638	0.0000	0.9816
22	2.20E-02	1.74E-02	4.64E-04	3.35E-18	9.91E-04	0.4638	0.0000	0.9909
1	1.00E-03	5.77E+00	4.64E-04	2.06E-18	9.55E-04	0.4638	0.0000	0.9552
2	2.00E-03	5.98E+00	4.64E-04	1.16E-18	9.08E-04	0.4640	0.0000	0.9076
3	3.00E-03	5.97E+00	4.64E-04	7.21E-19	8.60E-04	0.4643	0.0000	0.8598
4	4.00E-03	5.95E+00	4.65E-04	4.72E-19	8.12E-04	0.4647	0.0000	0.8122
5	5.00E-03	5.93E+00	4.65E-04	2.94E-19	7.65E-04	0.4652	0.0000	0.7646
6	6.00E-03	5.90E+00	4.66E-04	1.29E-19	7.17E-04	0.4659	0.0000	0.7171
7	7.00E-03	5.86E+00	4.67E-04	-7.20E-21	6.70E-04	0.4667	0.0000	0.6697
8	8.00E-03	5.82E+00	4.68E-04	-1.50E-19	6.23E-04	0.4677	0.0000	0.6225
9	9.00E-03	5.78E+00	4.69E-04	-2.79E-19	5.76E-04	0.4688	0.0000	0.5755
10	1.00E-02	5.72E+00	4.70E-04	-4.23E-19	5.29E-04	0.4701	0.0000	0.5287
11	1.10E-02	5.67E+00	4.72E-04	-5.44E-19	4.82E-04	0.4716	0.0000	0.4822
12	1.20E-02	5.60E+00	4.73E-04	-6.98E-19	4.36E-04	0.4732	0.0000	0.4359
13	1.30E-02	5.54E+00	4.75E-04	-8.21E-19	3.90E-04	0.4750	0.0000	0.3899
14	1.40E-02	5.47E+00	4.77E-04	-9.35E-19	3.44E-04	0.4771	0.0000	0.3442
15	1.50E-02	5.39E+00	4.79E-04	-1.03E-18	2.99E-04	0.4794	0.0000	0.2988
16	1.60E-02	5.31E+00	4.82E-04	-1.10E-18	2.54E-04	0.4819	0.0000	0.2537
17	1.70E-02	5.23E+00	4.85E-04	-1.15E-18	2.09E-04	0.4847	0.0000	0.2090
18	1.80E-02	5.14E+00	4.88E-04	-1.18E-18	1.65E-04	0.4878	0.0000	0.1648

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
19	1.90E-02	5.05E+00	4.91E-04	-1.12E-18	1.21E-04	0.4912	0.0000	0.1209
20	2.00E-02	4.97E+00	4.95E-04	-7.68E-19	7.74E-05	0.4950	0.0000	0.0774
1	1.00E-03	4.74E+00	4.92E-04	-1.30E-18	1.10E-04	0.4920	0.0000	0.1097
2	2.00E-03	5.02E+00	4.88E-04	-1.64E-18	1.53E-04	0.4883	0.0000	0.1530
3	3.00E-03	5.11E+00	4.85E-04	-1.74E-18	1.97E-04	0.4850	0.0000	0.1970
4	4.00E-03	5.20E+00	4.82E-04	-1.73E-18	2.41E-04	0.4819	0.0000	0.2414
5	5.00E-03	5.28E+00	4.79E-04	-1.62E-18	2.86E-04	0.4792	0.0000	0.2861
6	6.00E-03	5.36E+00	4.77E-04	-1.50E-18	3.31E-04	0.4767	0.0000	0.3312
7	7.00E-03	5.44E+00	4.74E-04	-1.40E-18	3.77E-04	0.4745	0.0000	0.3767
8	8.00E-03	5.51E+00	4.72E-04	-1.26E-18	4.22E-04	0.4725	0.0000	0.4225
9	9.00E-03	5.58E+00	4.71E-04	-1.16E-18	4.69E-04	0.4707	0.0000	0.4685
10	1.00E-02	5.65E+00	4.69E-04	-1.06E-18	5.15E-04	0.4691	0.0000	0.5149
11	1.10E-02	5.70E+00	4.68E-04	-9.61E-19	5.61E-04	0.4676	0.0000	0.5615
12	1.20E-02	5.76E+00	4.66E-04	-8.08E-19	6.08E-04	0.4664	0.0000	0.6083
13	1.30E-02	5.81E+00	4.65E-04	-6.93E-19	6.55E-04	0.4653	0.0000	0.6553
14	1.40E-02	5.85E+00	4.64E-04	-5.80E-19	7.03E-04	0.4644	0.0000	0.7026
15	1.50E-02	5.88E+00	4.64E-04	-4.39E-19	7.50E-04	0.4636	0.0000	0.7499
16	1.60E-02	5.92E+00	4.63E-04	-2.48E-19	7.97E-04	0.4629	0.0000	0.7974
17	1.70E-02	5.94E+00	4.62E-04	-3.19E-20	8.45E-04	0.4624	0.0000	0.8450
18	1.80E-02	5.96E+00	4.62E-04	2.78E-19	8.93E-04	0.4620	0.0000	0.8927
19	1.90E-02	5.97E+00	4.62E-04	7.34E-19	9.40E-04	0.4617	0.0000	0.9405
20	2.00E-02	5.99E+00	4.62E-04	1.73E-18	9.88E-04	0.4616	0.0000	0.9883
21	2.10E-02	1.73E-02	4.62E-04	3.26E-18	9.98E-04	0.4616	0.0000	0.9977
1	1.00E-03	5.77E+00	4.62E-04	1.92E-18	9.62E-04	0.4616	0.0000	0.9619
2	2.00E-03	5.98E+00	4.62E-04	9.65E-19	9.14E-04	0.4617	0.0000	0.9143
3	3.00E-03	5.97E+00	4.62E-04	4.99E-19	8.67E-04	0.4620	0.0000	0.8665
4	4.00E-03	5.95E+00	4.62E-04	2.35E-19	8.19E-04	0.4624	0.0000	0.8189
5	5.00E-03	5.93E+00	4.63E-04	5.10E-20	7.71E-04	0.4629	0.0000	0.7713

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
6	6.00E-03	5.90E+00	4.64E-04	-9.79E-20	7.24E-04	0.4636	0.0000	0.7238
7	7.00E-03	5.87E+00	4.64E-04	-2.34E-19	6.76E-04	0.4644	0.0000	0.6764
8	8.00E-03	5.83E+00	4.65E-04	-4.03E-19	6.29E-04	0.4653	0.0000	0.6292
9	9.00E-03	5.78E+00	4.66E-04	-5.22E-19	5.82E-04	0.4664	0.0000	0.5822
10	1.00E-02	5.73E+00	4.68E-04	-6.14E-19	5.35E-04	0.4677	0.0000	0.5354
11	1.10E-02	5.67E+00	4.69E-04	-7.32E-19	4.89E-04	0.4691	0.0000	0.4888
12	1.20E-02	5.61E+00	4.71E-04	-8.38E-19	4.42E-04	0.4707	0.0000	0.4424
13	1.30E-02	5.54E+00	4.73E-04	-9.13E-19	3.96E-04	0.4725	0.0000	0.3964
14	1.40E-02	5.47E+00	4.75E-04	-1.04E-18	3.51E-04	0.4745	0.0000	0.3506
15	1.50E-02	5.40E+00	4.77E-04	-1.17E-18	3.05E-04	0.4768	0.0000	0.3052
16	1.60E-02	5.32E+00	4.79E-04	-1.24E-18	2.60E-04	0.4793	0.0000	0.2601
17	1.70E-02	5.23E+00	4.82E-04	-1.32E-18	2.15E-04	0.4820	0.0000	0.2154
18	1.80E-02	5.15E+00	4.85E-04	-1.38E-18	1.71E-04	0.4851	0.0000	0.1711
19	1.90E-02	5.06E+00	4.88E-04	-1.31E-18	1.27E-04	0.4884	0.0000	0.1272
20	2.00E-02	4.98E+00	4.92E-04	-9.95E-19	8.36E-05	0.4921	0.0000	0.0836
1	1.00E-03	4.75E+00	4.89E-04	-1.45E-18	1.16E-04	0.4892	0.0000	0.1160
2	2.00E-03	5.03E+00	4.86E-04	-1.71E-18	1.59E-04	0.4855	0.0000	0.1594
3	3.00E-03	5.12E+00	4.82E-04	-1.74E-18	2.03E-04	0.4823	0.0000	0.2034
4	4.00E-03	5.21E+00	4.79E-04	-1.72E-18	2.48E-04	0.4793	0.0000	0.2478
5	5.00E-03	5.29E+00	4.77E-04	-1.67E-18	2.93E-04	0.4766	0.0000	0.2926
6	6.00E-03	5.37E+00	4.74E-04	-1.59E-18	3.38E-04	0.4741	0.0000	0.3377
7	7.00E-03	5.45E+00	4.72E-04	-1.49E-18	3.83E-04	0.4719	0.0000	0.3832
8	8.00E-03	5.52E+00	4.70E-04	-1.38E-18	4.29E-04	0.4700	0.0000	0.4290
9	9.00E-03	5.59E+00	4.68E-04	-1.24E-18	4.75E-04	0.4682	0.0000	0.4751
10	1.00E-02	5.65E+00	4.67E-04	-1.07E-18	5.21E-04	0.4666	0.0000	0.5215
11	1.10E-02	5.71E+00	4.65E-04	-9.55E-19	5.68E-04	0.4653	0.0000	0.5681
12	1.20E-02	5.76E+00	4.64E-04	-8.48E-19	6.15E-04	0.4640	0.0000	0.6150
13	1.30E-02	5.81E+00	4.63E-04	-7.27E-19	6.62E-04	0.4630	0.0000	0.6620

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
14	1.40E-02	5.85E+00	4.62E-04	-5.58E-19	7.09E-04	0.4620	0.0000	0.7092
15	1.50E-02	5.89E+00	4.61E-04	-4.23E-19	7.57E-04	0.4613	0.0000	0.7566
16	1.60E-02	5.92E+00	4.61E-04	-2.37E-19	8.04E-04	0.4606	0.0000	0.8041
17	1.70E-02	5.94E+00	4.60E-04	-4.21E-20	8.52E-04	0.4601	0.0000	0.8517
18	1.80E-02	5.96E+00	4.60E-04	2.06E-19	8.99E-04	0.4598	0.0000	0.8994
19	1.90E-02	5.97E+00	4.60E-04	7.10E-19	9.47E-04	0.4595	0.0000	0.9472
20	2.00E-02	5.99E+00	4.59E-04	1.87E-18	9.95E-04	0.4594	0.0000	0.9950
1	1.00E-03	5.76E+00	4.59E-04	5.28E-19	9.59E-04	0.4595	0.0000	0.9592
2	2.00E-03	5.97E+00	4.60E-04	-4.17E-19	9.12E-04	0.4596	0.0000	0.9117
3	3.00E-03	5.96E+00	4.60E-04	-8.78E-19	8.64E-04	0.4599	0.0000	0.8639
4	4.00E-03	5.95E+00	4.60E-04	-1.13E-18	8.16E-04	0.4603	0.0000	0.8162
5	5.00E-03	5.92E+00	4.61E-04	-1.32E-18	7.69E-04	0.4608	0.0000	0.7687
6	6.00E-03	5.90E+00	4.61E-04	-1.48E-18	7.21E-04	0.4615	0.0000	0.7212
7	7.00E-03	5.86E+00	4.62E-04	-1.62E-18	6.74E-04	0.4623	0.0000	0.6738
8	8.00E-03	5.82E+00	4.63E-04	-1.77E-18	6.27E-04	0.4632	0.0000	0.6266
9	9.00E-03	5.78E+00	4.64E-04	-1.87E-18	5.80E-04	0.4643	0.0000	0.5796
10	1.00E-02	5.73E+00	4.66E-04	-1.98E-18	5.33E-04	0.4656	0.0000	0.5328
11	1.10E-02	5.67E+00	4.67E-04	-2.10E-18	4.86E-04	0.4670	0.0000	0.4863
12	1.20E-02	5.61E+00	4.69E-04	-2.26E-18	4.40E-04	0.4686	0.0000	0.4400
13	1.30E-02	5.54E+00	4.70E-04	-2.36E-18	3.94E-04	0.4704	0.0000	0.3939
14	1.40E-02	5.47E+00	4.72E-04	-2.50E-18	3.48E-04	0.4725	0.0000	0.3482
15	1.50E-02	5.39E+00	4.75E-04	-2.58E-18	3.03E-04	0.4747	0.0000	0.3028
16	1.60E-02	5.31E+00	4.77E-04	-2.68E-18	2.58E-04	0.4772	0.0000	0.2578
17	1.70E-02	5.23E+00	4.80E-04	-2.74E-18	2.13E-04	0.4800	0.0000	0.2131
18	1.80E-02	5.14E+00	4.83E-04	-2.79E-18	1.69E-04	0.4830	0.0000	0.1688
19	1.90E-02	5.05E+00	4.86E-04	-2.73E-18	1.25E-04	0.4864	0.0000	0.1249
20	2.00E-02	4.97E+00	4.90E-04	-2.45E-18	8.14E-05	0.4901	0.0000	0.0814

Table C-6 The position of toner trajectory at the cone depth of dented electrode 1.0mm and the applied voltage 750V in unit (mm)

Step	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	3.86E-01	4.98E-04	-1.73E-19	1.09E-04	0.4982	0.0000	0.1091
2	2.00E-03	1.72E+00	4.94E-04	-8.94E-19	1.31E-04	0.4939	0.0000	0.1311
3	3.00E-03	1.79E+00	4.89E-04	-1.36E-18	1.57E-04	0.4892	0.0000	0.1567
4	4.00E-03	1.83E+00	4.85E-04	-1.58E-18	1.83E-04	0.4847	0.0000	0.1826
5	5.00E-03	1.87E+00	4.81E-04	-1.64E-18	2.09E-04	0.4805	0.0000	0.2089
6	6.00E-03	1.91E+00	4.76E-04	-1.65E-18	2.36E-04	0.4765	0.0000	0.2355
7	7.00E-03	1.95E+00	4.73E-04	-1.61E-18	2.62E-04	0.4727	0.0000	0.2625
8	8.00E-03	1.99E+00	4.69E-04	-1.57E-18	2.90E-04	0.4690	0.0000	0.2897
9	9.00E-03	2.03E+00	4.66E-04	-1.52E-18	3.17E-04	0.4656	0.0000	0.3173
10	1.00E-02	2.07E+00	4.62E-04	-1.41E-18	3.45E-04	0.4623	0.0000	0.3452
11	1.10E-02	2.12E+00	4.59E-04	-1.32E-18	3.73E-04	0.4592	0.0000	0.3734
12	1.20E-02	2.16E+00	4.56E-04	-1.23E-18	4.02E-04	0.4562	0.0000	0.4019
13	1.30E-02	2.20E+00	4.53E-04	-1.14E-18	4.31E-04	0.4534	0.0000	0.4307
14	1.40E-02	2.25E+00	4.51E-04	-1.06E-18	4.60E-04	0.4508	0.0000	0.4598
15	1.50E-02	2.29E+00	4.48E-04	-9.68E-19	4.89E-04	0.4482	0.0000	0.4892
16	1.60E-02	2.33E+00	4.46E-04	-8.37E-19	5.19E-04	0.4458	0.0000	0.5189
17	1.70E-02	2.37E+00	4.44E-04	-7.40E-19	5.49E-04	0.4435	0.0000	0.5488
18	1.80E-02	2.41E+00	4.41E-04	-6.33E-19	5.79E-04	0.4414	0.0000	0.5791
19	1.90E-02	2.45E+00	4.39E-04	-5.05E-19	6.10E-04	0.4393	0.0000	0.6095
20	2.00E-02	2.49E+00	4.37E-04	-4.05E-19	6.40E-04	0.4374	0.0000	0.6403
21	2.10E-02	2.53E+00	4.36E-04	-3.13E-19	6.71E-04	0.4355	0.0000	0.6712
22	2.20E-02	2.57E+00	4.34E-04	-2.16E-19	7.02E-04	0.4338	0.0000	0.7025
23	2.30E-02	2.60E+00	4.32E-04	-1.26E-19	7.34E-04	0.4321	0.0000	0.7339
24	2.40E-02	2.64E+00	4.31E-04	2.55E-21	7.66E-04	0.4305	0.0000	0.7656
25	2.50E-02	2.67E+00	4.29E-04	1.33E-19	7.97E-04	0.4290	0.0000	0.7974

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
26	2.60E-02	2.71E+00	4.28E-04	2.46E-19	8.29E-04	0.4276	0.0000	0.8295
27	2.70E-02	2.74E+00	4.26E-04	3.52E-19	8.62E-04	0.4263	0.0000	0.8618
28	2.80E-02	2.77E+00	4.25E-04	4.77E-19	8.94E-04	0.4251	0.0000	0.8942
29	2.90E-02	2.80E+00	4.24E-04	5.82E-19	9.27E-04	0.4239	0.0000	0.9268
30	3.00E-02	2.82E+00	4.23E-04	7.07E-19	9.60E-04	0.4228	0.0000	0.9596
31	3.10E-02	2.85E+00	4.22E-04	8.44E-19	9.93E-04	0.4218	0.0000	0.9925
32	3.20E-02	2.87E+00	4.21E-04	9.88E-19	1.03E-03	0.4209	0.0000	1.0256
33	3.30E-02	2.90E+00	4.20E-04	1.11E-18	1.06E-03	0.4200	0.0000	1.0588
34	3.40E-02	2.92E+00	4.19E-04	1.24E-18	1.09E-03	0.4192	0.0000	1.0922
35	3.50E-02	2.94E+00	4.18E-04	1.36E-18	1.13E-03	0.4185	0.0000	1.1256
36	3.60E-02	2.96E+00	4.18E-04	1.51E-18	1.16E-03	0.4178	0.0000	1.1592
37	3.70E-02	2.97E+00	4.17E-04	1.67E-18	1.19E-03	0.4172	0.0000	1.1929
38	3.80E-02	2.99E+00	4.17E-04	1.83E-18	1.23E-03	0.4167	0.0000	1.2266
39	3.90E-02	3.00E+00	4.16E-04	1.99E-18	1.26E-03	0.4162	0.0000	1.2605
40	4.00E-02	3.01E+00	4.16E-04	2.15E-18	1.29E-03	0.4158	0.0000	1.2944
41	4.10E-02	3.02E+00	4.15E-04	2.32E-18	1.33E-03	0.4154	0.0000	1.3283
42	4.20E-02	3.03E+00	4.15E-04	2.51E-18	1.36E-03	0.4151	0.0000	1.3624
43	4.30E-02	3.04E+00	4.15E-04	2.77E-18	1.40E-03	0.4149	0.0000	1.3964
44	4.40E-02	3.04E+00	4.15E-04	3.12E-18	1.43E-03	0.4147	0.0000	1.4305
45	4.50E-02	3.05E+00	4.15E-04	3.63E-18	1.46E-03	0.4146	0.0000	1.4646
46	4.60E-02	3.05E+00	4.15E-04	4.64E-18	1.50E-03	0.4146	0.0000	1.4988
1	1.00E-03	2.95E+00	4.15E-04	3.60E-18	1.47E-03	0.4146	0.0000	1.4732
2	2.00E-03	3.05E+00	4.15E-04	2.71E-18	1.44E-03	0.4146	0.0000	1.4392
3	3.00E-03	3.05E+00	4.15E-04	2.20E-18	1.41E-03	0.4147	0.0000	1.4051
4	4.00E-03	3.04E+00	4.15E-04	1.88E-18	1.37E-03	0.4149	0.0000	1.3710
5	5.00E-03	3.03E+00	4.15E-04	1.66E-18	1.34E-03	0.4151	0.0000	1.3370
6	6.00E-03	3.03E+00	4.15E-04	1.47E-18	1.30E-03	0.4154	0.0000	1.3030
7	7.00E-03	3.02E+00	4.16E-04	1.32E-18	1.27E-03	0.4158	0.0000	1.2690

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
8	8.00E-03	3.00E+00	4.16E-04	1.16E-18	1.24E-03	0.4162	0.0000	1.2351
9	9.00E-03	2.99E+00	4.17E-04	1.04E-18	1.20E-03	0.4167	0.0000	1.2013
10	1.00E-02	2.98E+00	4.17E-04	8.81E-19	1.17E-03	0.4173	0.0000	1.1676
11	1.10E-02	2.96E+00	4.18E-04	7.06E-19	1.13E-03	0.4179	0.0000	1.1339
12	1.20E-02	2.94E+00	4.19E-04	5.51E-19	1.10E-03	0.4186	0.0000	1.1004
13	1.30E-02	2.92E+00	4.19E-04	4.10E-19	1.07E-03	0.4193	0.0000	1.0669
14	1.40E-02	2.90E+00	4.20E-04	2.61E-19	1.03E-03	0.4201	0.0000	1.0336
15	1.50E-02	2.88E+00	4.21E-04	9.71E-20	1.00E-03	0.4210	0.0000	1.0004
16	1.60E-02	2.86E+00	4.22E-04	-4.54E-20	9.67E-04	0.4220	0.0000	0.9674
17	1.70E-02	2.83E+00	4.23E-04	-1.93E-19	9.35E-04	0.4230	0.0000	0.9345
18	1.80E-02	2.80E+00	4.24E-04	-3.40E-19	9.02E-04	0.4241	0.0000	0.9018
19	1.90E-02	2.77E+00	4.25E-04	-4.75E-19	8.69E-04	0.4253	0.0000	0.8692
20	2.00E-02	2.74E+00	4.27E-04	-5.83E-19	8.37E-04	0.4266	0.0000	0.8368
21	2.10E-02	2.71E+00	4.28E-04	-6.60E-19	8.05E-04	0.4279	0.0000	0.8046
22	2.20E-02	2.68E+00	4.29E-04	-7.28E-19	7.73E-04	0.4293	0.0000	0.7726
23	2.30E-02	2.65E+00	4.31E-04	-8.27E-19	7.41E-04	0.4308	0.0000	0.7408
24	2.40E-02	2.61E+00	4.32E-04	-9.38E-19	7.09E-04	0.4324	0.0000	0.7092
25	2.50E-02	2.58E+00	4.34E-04	-1.04E-18	6.78E-04	0.4341	0.0000	0.6778
26	2.60E-02	2.54E+00	4.36E-04	-1.14E-18	6.47E-04	0.4359	0.0000	0.6466
27	2.70E-02	2.50E+00	4.38E-04	-1.27E-18	6.16E-04	0.4377	0.0000	0.6157
28	2.80E-02	2.46E+00	4.40E-04	-1.38E-18	5.85E-04	0.4397	0.0000	0.5851
29	2.90E-02	2.42E+00	4.42E-04	-1.50E-18	5.55E-04	0.4418	0.0000	0.5547
30	3.00E-02	2.38E+00	4.44E-04	-1.63E-18	5.25E-04	0.4440	0.0000	0.5245
31	3.10E-02	2.34E+00	4.46E-04	-1.74E-18	4.95E-04	0.4463	0.0000	0.4947
32	3.20E-02	2.30E+00	4.49E-04	-1.85E-18	4.65E-04	0.4487	0.0000	0.4651
33	3.30E-02	2.25E+00	4.51E-04	-1.96E-18	4.36E-04	0.4513	0.0000	0.4358
34	3.40E-02	2.21E+00	4.54E-04	-2.02E-18	4.07E-04	0.4540	0.0000	0.4068
35	3.50E-02	2.17E+00	4.57E-04	-2.09E-18	3.78E-04	0.4569	0.0000	0.3781

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
36	3.60E-02	2.12E+00	4.60E-04	-2.19E-18	3.50E-04	0.4598	0.0000	0.3497
37	3.70E-02	2.08E+00	4.63E-04	-2.28E-18	3.22E-04	0.4630	0.0000	0.3216
38	3.80E-02	2.04E+00	4.66E-04	-2.35E-18	2.94E-04	0.4663	0.0000	0.2938
39	3.90E-02	1.99E+00	4.70E-04	-2.41E-18	2.66E-04	0.4698	0.0000	0.2664
40	4.00E-02	1.95E+00	4.74E-04	-2.47E-18	2.39E-04	0.4735	0.0000	0.2392
41	4.10E-02	1.91E+00	4.77E-04	-2.49E-18	2.12E-04	0.4774	0.0000	0.2124
42	4.20E-02	1.87E+00	4.81E-04	-2.43E-18	1.86E-04	0.4815	0.0000	0.1860
43	4.30E-02	1.83E+00	4.86E-04	-2.33E-18	1.60E-04	0.4858	0.0000	0.1598
44	4.40E-02	1.79E+00	4.90E-04	-2.09E-18	1.34E-04	0.4903	0.0000	0.1340
45	4.50E-02	1.76E+00	4.95E-04	-1.49E-18	1.08E-04	0.4951	0.0000	0.1084
46	4.60E-02	6.24E-04	4.96E-04	-1.89E-18	1.03E-04	0.4961	0.0000	0.1028
1	1.00E-03	1.67E+00	4.92E-04	-2.87E-18	1.22E-04	0.4924	0.0000	0.1216
2	2.00E-03	1.77E+00	4.88E-04	-3.57E-18	1.47E-04	0.4877	0.0000	0.1470
3	3.00E-03	1.81E+00	4.83E-04	-3.83E-18	1.73E-04	0.4831	0.0000	0.1728
4	4.00E-03	1.85E+00	4.79E-04	-3.94E-18	1.99E-04	0.4788	0.0000	0.1990
5	5.00E-03	1.89E+00	4.75E-04	-3.96E-18	2.25E-04	0.4747	0.0000	0.2255
6	6.00E-03	1.93E+00	4.71E-04	-3.94E-18	2.52E-04	0.4709	0.0000	0.2522
7	7.00E-03	1.97E+00	4.67E-04	-3.90E-18	2.79E-04	0.4672	0.0000	0.2794
8	8.00E-03	2.01E+00	4.64E-04	-3.82E-18	3.07E-04	0.4637	0.0000	0.3068
9	9.00E-03	2.06E+00	4.60E-04	-3.72E-18	3.35E-04	0.4603	0.0000	0.3345
10	1.00E-02	2.10E+00	4.57E-04	-3.63E-18	3.63E-04	0.4572	0.0000	0.3626
11	1.10E-02	2.14E+00	4.54E-04	-3.54E-18	3.91E-04	0.4542	0.0000	0.3910
12	1.20E-02	2.18E+00	4.51E-04	-3.47E-18	4.20E-04	0.4513	0.0000	0.4197
13	1.30E-02	2.23E+00	4.49E-04	-3.37E-18	4.49E-04	0.4486	0.0000	0.4486
14	1.40E-02	2.27E+00	4.46E-04	-3.27E-18	4.78E-04	0.4461	0.0000	0.4779
15	1.50E-02	2.31E+00	4.44E-04	-3.16E-18	5.07E-04	0.4436	0.0000	0.5075
16	1.60E-02	2.35E+00	4.41E-04	-3.04E-18	5.37E-04	0.4413	0.0000	0.5373
17	1.70E-02	2.40E+00	4.39E-04	-2.97E-18	5.67E-04	0.4391	0.0000	0.5674

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
18	1.80E-02	2.44E+00	4.37E-04	-2.85E-18	5.98E-04	0.4370	0.0000	0.5978
19	1.90E-02	2.48E+00	4.35E-04	-2.76E-18	6.28E-04	0.4350	0.0000	0.6284
20	2.00E-02	2.51E+00	4.33E-04	-2.67E-18	6.59E-04	0.4332	0.0000	0.6593
21	2.10E-02	2.55E+00	4.31E-04	-2.56E-18	6.90E-04	0.4314	0.0000	0.6904
22	2.20E-02	2.59E+00	4.30E-04	-2.46E-18	7.22E-04	0.4297	0.0000	0.7217
23	2.30E-02	2.62E+00	4.28E-04	-2.37E-18	7.53E-04	0.4281	0.0000	0.7533
24	2.40E-02	2.66E+00	4.27E-04	-2.24E-18	7.85E-04	0.4266	0.0000	0.7851
25	2.50E-02	2.69E+00	4.25E-04	-2.13E-18	8.17E-04	0.4252	0.0000	0.8171
26	2.60E-02	2.72E+00	4.24E-04	-2.03E-18	8.49E-04	0.4238	0.0000	0.8493
27	2.70E-02	2.75E+00	4.23E-04	-1.87E-18	8.82E-04	0.4226	0.0000	0.8816
28	2.80E-02	2.78E+00	4.21E-04	-1.73E-18	9.14E-04	0.4214	0.0000	0.9142
29	2.90E-02	2.81E+00	4.20E-04	-1.57E-18	9.47E-04	0.4203	0.0000	0.9469
30	3.00E-02	2.84E+00	4.19E-04	-1.47E-18	9.80E-04	0.4193	0.0000	0.9798
31	3.10E-02	2.86E+00	4.18E-04	-1.38E-18	1.01E-03	0.4183	0.0000	1.0128
32	3.20E-02	2.89E+00	4.17E-04	-1.25E-18	1.05E-03	0.4174	0.0000	1.0459
33	3.30E-02	2.91E+00	4.17E-04	-1.09E-18	1.08E-03	0.4166	0.0000	1.0792
34	3.40E-02	2.93E+00	4.16E-04	-9.44E-19	1.11E-03	0.4158	0.0000	1.1126
35	3.50E-02	2.95E+00	4.15E-04	-8.23E-19	1.15E-03	0.4151	0.0000	1.1462
36	3.60E-02	2.97E+00	4.15E-04	-6.45E-19	1.18E-03	0.4145	0.0000	1.1798
37	3.70E-02	2.98E+00	4.14E-04	-4.89E-19	1.21E-03	0.4139	0.0000	1.2135
38	3.80E-02	3.00E+00	4.13E-04	-2.95E-19	1.25E-03	0.4134	0.0000	1.2473
39	3.90E-02	3.01E+00	4.13E-04	-1.35E-19	1.28E-03	0.4130	0.0000	1.2812
40	4.00E-02	3.02E+00	4.13E-04	4.33E-20	1.32E-03	0.4126	0.0000	1.3151
41	4.10E-02	3.03E+00	4.12E-04	2.44E-19	1.35E-03	0.4123	0.0000	1.3491
42	4.20E-02	3.04E+00	4.12E-04	4.64E-19	1.38E-03	0.4121	0.0000	1.3832
43	4.30E-02	3.04E+00	4.12E-04	7.84E-19	1.42E-03	0.4119	0.0000	1.4172
44	4.40E-02	3.05E+00	4.12E-04	1.29E-18	1.45E-03	0.4117	0.0000	1.4513
45	4.50E-02	3.05E+00	4.12E-04	2.12E-18	1.49E-03	0.4117	0.0000	1.4855

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
46	4.60E-02	2.12E-02	4.12E-04	3.41E-18	1.49E-03	0.4118	0.0000	1.4914
1	1.00E-03	2.94E+00	4.12E-04	2.42E-18	1.47E-03	0.4117	0.0000	1.4658
2	2.00E-03	3.05E+00	4.12E-04	1.60E-18	1.43E-03	0.4118	0.0000	1.4319
3	3.00E-03	3.04E+00	4.12E-04	1.17E-18	1.40E-03	0.4119	0.0000	1.3978
4	4.00E-03	3.04E+00	4.12E-04	8.81E-19	1.36E-03	0.4121	0.0000	1.3637
5	5.00E-03	3.03E+00	4.12E-04	6.22E-19	1.33E-03	0.4124	0.0000	1.3297
6	6.00E-03	3.02E+00	4.13E-04	3.83E-19	1.30E-03	0.4127	0.0000	1.2957
7	7.00E-03	3.01E+00	4.13E-04	2.17E-19	1.26E-03	0.4130	0.0000	1.2618
8	8.00E-03	3.00E+00	4.13E-04	7.82E-20	1.23E-03	0.4135	0.0000	1.2279
9	9.00E-03	2.99E+00	4.14E-04	-9.77E-20	1.19E-03	0.4140	0.0000	1.1941
10	1.00E-02	2.97E+00	4.15E-04	-2.80E-19	1.16E-03	0.4146	0.0000	1.1604
11	1.10E-02	2.96E+00	4.15E-04	-4.26E-19	1.13E-03	0.4152	0.0000	1.1268
12	1.20E-02	2.94E+00	4.16E-04	-5.49E-19	1.09E-03	0.4159	0.0000	1.0932
13	1.30E-02	2.92E+00	4.17E-04	-6.86E-19	1.06E-03	0.4166	0.0000	1.0598
14	1.40E-02	2.90E+00	4.17E-04	-8.06E-19	1.03E-03	0.4175	0.0000	1.0266
15	1.50E-02	2.87E+00	4.18E-04	-9.58E-19	9.93E-04	0.4184	0.0000	0.9934
16	1.60E-02	2.85E+00	4.19E-04	-1.04E-18	9.60E-04	0.4193	0.0000	0.9604
17	1.70E-02	2.82E+00	4.20E-04	-1.13E-18	9.28E-04	0.4204	0.0000	0.9275
18	1.80E-02	2.80E+00	4.21E-04	-1.23E-18	8.95E-04	0.4215	0.0000	0.8948
19	1.90E-02	2.77E+00	4.23E-04	-1.34E-18	8.62E-04	0.4227	0.0000	0.8623
20	2.00E-02	2.74E+00	4.24E-04	-1.47E-18	8.30E-04	0.4239	0.0000	0.8300
21	2.10E-02	2.71E+00	4.25E-04	-1.60E-18	7.98E-04	0.4253	0.0000	0.7978
22	2.20E-02	2.67E+00	4.27E-04	-1.74E-18	7.66E-04	0.4267	0.0000	0.7658
23	2.30E-02	2.64E+00	4.28E-04	-1.89E-18	7.34E-04	0.4282	0.0000	0.7341
24	2.40E-02	2.60E+00	4.30E-04	-2.01E-18	7.03E-04	0.4298	0.0000	0.7025
25	2.50E-02	2.57E+00	4.32E-04	-2.13E-18	6.71E-04	0.4315	0.0000	0.6712
26	2.60E-02	2.53E+00	4.33E-04	-2.25E-18	6.40E-04	0.4333	0.0000	0.6401
27	2.70E-02	2.49E+00	4.35E-04	-2.38E-18	6.09E-04	0.4352	0.0000	0.6093

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
11	1.10E-02	2.14E+00	4.51E-04	-4.19E-18	3.91E-04	0.4511	0.0000	0.3915
12	1.20E-02	2.18E+00	4.48E-04	-4.11E-18	4.20E-04	0.4483	0.0000	0.4201
13	1.30E-02	2.23E+00	4.46E-04	-4.02E-18	4.49E-04	0.4456	0.0000	0.4491
14	1.40E-02	2.27E+00	4.43E-04	-3.88E-18	4.78E-04	0.4431	0.0000	0.4784
15	1.50E-02	2.31E+00	4.41E-04	-3.75E-18	5.08E-04	0.4406	0.0000	0.5079
16	1.60E-02	2.35E+00	4.38E-04	-3.63E-18	5.38E-04	0.4383	0.0000	0.5377
17	1.70E-02	2.39E+00	4.36E-04	-3.55E-18	5.68E-04	0.4361	0.0000	0.5678
18	1.80E-02	2.44E+00	4.34E-04	-3.47E-18	5.98E-04	0.4341	0.0000	0.5982
19	1.90E-02	2.47E+00	4.32E-04	-3.38E-18	6.29E-04	0.4321	0.0000	0.6288
20	2.00E-02	2.51E+00	4.30E-04	-3.23E-18	6.60E-04	0.4302	0.0000	0.6597
21	2.10E-02	2.55E+00	4.28E-04	-3.12E-18	6.91E-04	0.4285	0.0000	0.6908
22	2.20E-02	2.59E+00	4.27E-04	-3.01E-18	7.22E-04	0.4268	0.0000	0.7222
23	2.30E-02	2.62E+00	4.25E-04	-2.89E-18	7.54E-04	0.4252	0.0000	0.7537
24	2.40E-02	2.66E+00	4.24E-04	-2.76E-18	7.85E-04	0.4237	0.0000	0.7855
25	2.50E-02	2.69E+00	4.22E-04	-2.64E-18	8.17E-04	0.4223	0.0000	0.8175
26	2.60E-02	2.72E+00	4.21E-04	-2.53E-18	8.50E-04	0.4210	0.0000	0.8497
27	2.70E-02	2.75E+00	4.20E-04	-2.41E-18	8.82E-04	0.4197	0.0000	0.8820
28	2.80E-02	2.78E+00	4.19E-04	-2.29E-18	9.15E-04	0.4186	0.0000	0.9146
29	2.90E-02	2.81E+00	4.17E-04	-2.17E-18	9.47E-04	0.4175	0.0000	0.9473
30	3.00E-02	2.84E+00	4.16E-04	-2.02E-18	9.80E-04	0.4164	0.0000	0.9801
31	3.10E-02	2.86E+00	4.15E-04	-1.84E-18	1.01E-03	0.4155	0.0000	1.0131
32	3.20E-02	2.89E+00	4.15E-04	-1.70E-18	1.05E-03	0.4146	0.0000	1.0463
33	3.30E-02	2.91E+00	4.14E-04	-1.58E-18	1.08E-03	0.4138	0.0000	1.0796
34	3.40E-02	2.93E+00	4.13E-04	-1.46E-18	1.11E-03	0.4130	0.0000	1.1130
35	3.50E-02	2.95E+00	4.12E-04	-1.33E-18	1.15E-03	0.4123	0.0000	1.1465
36	3.60E-02	2.96E+00	4.12E-04	-1.17E-18	1.18E-03	0.4117	0.0000	1.1801
37	3.70E-02	2.98E+00	4.11E-04	-1.05E-18	1.21E-03	0.4111	0.0000	1.2138
38	3.80E-02	2.99E+00	4.11E-04	-8.77E-19	1.25E-03	0.4107	0.0000	1.2476

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
39	3.90E-02	3.01E+00	4.10E-04	-7.10E-19	1.28E-03	0.4102	0.0000	1.2815
40	4.00E-02	3.02E+00	4.10E-04	-5.51E-19	1.32E-03	0.4098	0.0000	1.3155
41	4.10E-02	3.03E+00	4.10E-04	-3.42E-19	1.35E-03	0.4095	0.0000	1.3494
42	4.20E-02	3.03E+00	4.09E-04	-6.54E-20	1.38E-03	0.4093	0.0000	1.3835
43	4.30E-02	3.04E+00	4.09E-04	2.62E-19	1.42E-03	0.4091	0.0000	1.4175
44	4.40E-02	3.04E+00	4.09E-04	7.07E-19	1.45E-03	0.4090	0.0000	1.4516
45	4.50E-02	3.05E+00	4.09E-04	1.53E-18	1.49E-03	0.4089	0.0000	1.4858
46	4.60E-02	2.07E-02	4.09E-04	2.81E-18	1.49E-03	0.4090	0.0000	1.4917
1	1.00E-03	2.93E+00	4.09E-04	1.78E-18	1.47E-03	0.4090	0.0000	1.4662
2	2.00E-03	3.04E+00	4.09E-04	9.67E-19	1.43E-03	0.4090	0.0000	1.4322
3	3.00E-03	3.04E+00	4.09E-04	5.30E-19	1.40E-03	0.4091	0.0000	1.3982
4	4.00E-03	3.04E+00	4.09E-04	2.22E-19	1.36E-03	0.4093	0.0000	1.3641
5	5.00E-03	3.03E+00	4.10E-04	-2.51E-21	1.33E-03	0.4096	0.0000	1.3300
6	6.00E-03	3.02E+00	4.10E-04	-2.06E-19	1.30E-03	0.4099	0.0000	1.2961
7	7.00E-03	3.01E+00	4.10E-04	-3.60E-19	1.26E-03	0.4103	0.0000	1.2621
8	8.00E-03	3.00E+00	4.11E-04	-5.26E-19	1.23E-03	0.4107	0.0000	1.2283
9	9.00E-03	2.99E+00	4.11E-04	-7.20E-19	1.19E-03	0.4112	0.0000	1.1945
10	1.00E-02	2.97E+00	4.12E-04	-8.17E-19	1.16E-03	0.4118	0.0000	1.1608
11	1.10E-02	2.96E+00	4.12E-04	-8.99E-19	1.13E-03	0.4124	0.0000	1.1272
12	1.20E-02	2.94E+00	4.13E-04	-1.02E-18	1.09E-03	0.4131	0.0000	1.0936
13	1.30E-02	2.92E+00	4.14E-04	-1.13E-18	1.06E-03	0.4138	0.0000	1.0602
14	1.40E-02	2.90E+00	4.15E-04	-1.25E-18	1.03E-03	0.4147	0.0000	1.0270
15	1.50E-02	2.87E+00	4.16E-04	-1.32E-18	9.94E-04	0.4156	0.0000	0.9938
16	1.60E-02	2.85E+00	4.17E-04	-1.46E-18	9.61E-04	0.4165	0.0000	0.9608
17	1.70E-02	2.82E+00	4.18E-04	-1.62E-18	9.28E-04	0.4175	0.0000	0.9280
18	1.80E-02	2.80E+00	4.19E-04	-1.72E-18	8.95E-04	0.4187	0.0000	0.8953
19	1.90E-02	2.77E+00	4.20E-04	-1.83E-18	8.63E-04	0.4198	0.0000	0.8627
20	2.00E-02	2.74E+00	4.21E-04	-1.96E-18	8.30E-04	0.4211	0.0000	0.8304

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
21	2.10E-02	2.70E+00	4.22E-04	-2.07E-18	7.98E-04	0.4224	0.0000	0.7982
22	2.20E-02	2.67E+00	4.24E-04	-2.22E-18	7.66E-04	0.4238	0.0000	0.7663
23	2.30E-02	2.64E+00	4.25E-04	-2.33E-18	7.35E-04	0.4253	0.0000	0.7345
24	2.40E-02	2.60E+00	4.27E-04	-2.43E-18	7.03E-04	0.4269	0.0000	0.7030
25	2.50E-02	2.57E+00	4.29E-04	-2.52E-18	6.72E-04	0.4286	0.0000	0.6717
26	2.60E-02	2.53E+00	4.30E-04	-2.58E-18	6.41E-04	0.4304	0.0000	0.6406
27	2.70E-02	2.49E+00	4.32E-04	-2.62E-18	6.10E-04	0.4323	0.0000	0.6097
28	2.80E-02	2.45E+00	4.34E-04	-2.70E-18	5.79E-04	0.4342	0.0000	0.5791
29	2.90E-02	2.41E+00	4.36E-04	-2.79E-18	5.49E-04	0.4363	0.0000	0.5488
30	3.00E-02	2.37E+00	4.38E-04	-2.89E-18	5.19E-04	0.4385	0.0000	0.5187
31	3.10E-02	2.33E+00	4.41E-04	-3.04E-18	4.89E-04	0.4408	0.0000	0.4890
32	3.20E-02	2.29E+00	4.43E-04	-3.17E-18	4.59E-04	0.4432	0.0000	0.4594
33	3.30E-02	2.24E+00	4.46E-04	-3.31E-18	4.30E-04	0.4458	0.0000	0.4302
34	3.40E-02	2.20E+00	4.49E-04	-3.44E-18	4.01E-04	0.4485	0.0000	0.4013
35	3.50E-02	2.16E+00	4.51E-04	-3.54E-18	3.73E-04	0.4514	0.0000	0.3727
36	3.60E-02	2.11E+00	4.54E-04	-3.64E-18	3.44E-04	0.4543	0.0000	0.3444
37	3.70E-02	2.07E+00	4.58E-04	-3.70E-18	3.16E-04	0.4575	0.0000	0.3164
38	3.80E-02	2.02E+00	4.61E-04	-3.77E-18	2.89E-04	0.4608	0.0000	0.2887
39	3.90E-02	1.98E+00	4.64E-04	-3.83E-18	2.61E-04	0.4643	0.0000	0.2613
40	4.00E-02	1.94E+00	4.68E-04	-3.86E-18	2.34E-04	0.4680	0.0000	0.2343
41	4.10E-02	1.90E+00	4.72E-04	-3.90E-18	2.08E-04	0.4719	0.0000	0.2076
42	4.20E-02	1.85E+00	4.76E-04	-3.88E-18	1.81E-04	0.4760	0.0000	0.1812
43	4.30E-02	1.82E+00	4.80E-04	-3.76E-18	1.55E-04	0.4803	0.0000	0.1552
44	4.40E-02	1.78E+00	4.85E-04	-3.42E-18	1.29E-04	0.4849	0.0000	0.1295
45	4.50E-02	1.74E+00	4.90E-04	-2.61E-18	1.04E-04	0.4896	0.0000	0.1041

Table C-7 The position of toner trajectory at the cone depth of dented electrode 0.2mm and the applied voltage 1000V in unit (mm)

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	4.39E+00	4.99E-04	-7.56E-19	5.12E-05	0.4987	0.0000	0.0512
2	2.00E-03	1.85E+01	4.96E-04	-1.42E-18	1.25E-04	0.4961	0.0000	0.1250
3	3.00E-03	1.91E+01	4.94E-04	-1.59E-18	2.10E-04	0.4936	0.0000	0.2100
4	4.00E-03	1.93E+01	4.92E-04	-1.48E-18	2.96E-04	0.4917	0.0000	0.2958
5	5.00E-03	1.95E+01	4.90E-04	-1.30E-18	3.82E-04	0.4901	0.0000	0.3820
6	6.00E-03	1.96E+01	4.89E-04	-1.09E-18	4.69E-04	0.4890	0.0000	0.4685
7	7.00E-03	1.97E+01	4.88E-04	-8.07E-19	5.55E-04	0.4883	0.0000	0.5553
8	8.00E-03	1.98E+01	4.88E-04	-2.42E-19	6.42E-04	0.4878	0.0000	0.6423
1	1.00E-03	1.91E+01	4.88E-04	-1.28E-18	5.77E-04	0.4880	0.0000	0.5772
2	2.00E-03	1.98E+01	4.88E-04	-1.95E-18	4.91E-04	0.4885	0.0000	0.4907
3	3.00E-03	1.97E+01	4.89E-04	-2.26E-18	4.04E-04	0.4893	0.0000	0.4039
4	4.00E-03	1.95E+01	4.91E-04	-2.48E-18	3.17E-04	0.4905	0.0000	0.3175
5	5.00E-03	1.94E+01	4.92E-04	-2.64E-18	2.31E-04	0.4921	0.0000	0.2314
6	6.00E-03	1.92E+01	4.94E-04	-2.69E-18	1.46E-04	0.4942	0.0000	0.1457
7	7.00E-03	1.89E+01	4.97E-04	-2.51E-18	6.06E-05	0.4968	0.0000	0.0606
8	8.00E-03	1.23E-03	4.97E-04	-2.33E-18	3.99E-05	0.4975	0.0000	0.0399
1	1.00E-03	1.80E+01	4.95E-04	-3.21E-18	1.03E-04	0.4951	0.0000	0.1032
2	2.00E-03	1.90E+01	4.92E-04	-3.56E-18	1.88E-04	0.4925	0.0000	0.1879
3	3.00E-03	1.93E+01	4.90E-04	-3.48E-18	2.73E-04	0.4904	0.0000	0.2735
4	4.00E-03	1.95E+01	4.89E-04	-3.33E-18	3.60E-04	0.4888	0.0000	0.3596
5	5.00E-03	1.96E+01	4.88E-04	-3.18E-18	4.46E-04	0.4875	0.0000	0.4460
6	6.00E-03	1.97E+01	4.87E-04	-2.91E-18	5.33E-04	0.4867	0.0000	0.5327
7	7.00E-03	1.98E+01	4.86E-04	-2.47E-18	6.20E-04	0.4862	0.0000	0.6197
1	1.00E-03	1.91E+01	4.86E-04	-3.21E-18	5.55E-04	0.4864	0.0000	0.5546
2	2.00E-03	1.97E+01	4.87E-04	-3.70E-18	4.68E-04	0.4870	0.0000	0.4681

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
3	3.00E-03	1.96E+01	4.88E-04	-3.96E-18	3.81E-04	0.4879	0.0000	0.3815
4	4.00E-03	1.95E+01	4.89E-04	-4.07E-18	2.95E-04	0.4892	0.0000	0.2951
5	5.00E-03	1.93E+01	4.91E-04	-4.17E-18	2.09E-04	0.4909	0.0000	0.2091
6	6.00E-03	1.91E+01	4.93E-04	-4.27E-18	1.24E-04	0.4931	0.0000	0.1236
7	7.00E-03	1.89E+01	4.96E-04	-3.93E-18	3.86E-05	0.4959	0.0000	0.0386
1	1.00E-03	1.80E+01	4.93E-04	-4.83E-18	1.02E-04	0.4935	0.0000	0.1019
2	2.00E-03	1.90E+01	4.91E-04	-5.14E-18	1.87E-04	0.4908	0.0000	0.1865
3	3.00E-03	1.93E+01	4.89E-04	-5.07E-18	2.72E-04	0.4887	0.0000	0.2722
4	4.00E-03	1.94E+01	4.87E-04	-4.91E-18	3.58E-04	0.4871	0.0000	0.3582
5	5.00E-03	1.96E+01	4.86E-04	-4.82E-18	4.45E-04	0.4859	0.0000	0.4447
6	6.00E-03	1.97E+01	4.85E-04	-4.59E-18	5.31E-04	0.4850	0.0000	0.5314
7	7.00E-03	1.98E+01	4.85E-04	-4.13E-18	6.18E-04	0.4845	0.0000	0.6183
1	1.00E-03	1.91E+01	4.85E-04	-4.84E-18	5.53E-04	0.4847	0.0000	0.5532
2	2.00E-03	1.97E+01	4.85E-04	-5.33E-18	4.67E-04	0.4853	0.0000	0.4667
3	3.00E-03	1.96E+01	4.86E-04	-5.56E-18	3.80E-04	0.4863	0.0000	0.3801
4	4.00E-03	1.95E+01	4.88E-04	-5.71E-18	2.94E-04	0.4876	0.0000	0.2937
5	5.00E-03	1.93E+01	4.89E-04	-5.76E-18	2.08E-04	0.4893	0.0000	0.2078
6	6.00E-03	1.91E+01	4.92E-04	-5.80E-18	1.22E-04	0.4915	0.0000	0.1223
7	7.00E-03	1.89E+01	4.94E-04	-5.40E-18	3.73E-05	0.4943	0.0000	0.0373
8	8.00E-03	8.85E-04	4.95E-04	-4.85E-18	1.68E-05	0.4950	0.0000	0.0168

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Table C-8 The position of toner trajectory at the cone depth of dented electrode 0.5mm and the applied voltage 1000V in unit (mm)

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	2.01E+00	4.98E-04	-4.86E-19	7.10E-05	0.4979	0.0000	0.0710
2	2.00E-03	8.62E+00	4.93E-04	-1.24E-18	1.21E-04	0.4932	0.0000	0.1212
3	3.00E-03	9.00E+00	4.88E-04	-1.49E-18	1.79E-04	0.4884	0.0000	0.1793
4	4.00E-03	9.21E+00	4.84E-04	-1.52E-18	2.38E-04	0.4842	0.0000	0.2383
5	5.00E-03	9.41E+00	4.81E-04	-1.44E-18	2.98E-04	0.4806	0.0000	0.2980
6	6.00E-03	9.60E+00	4.77E-04	-1.38E-18	3.58E-04	0.4774	0.0000	0.3583
7	7.00E-03	9.77E+00	4.75E-04	-1.24E-18	4.19E-04	0.4746	0.0000	0.4192
8	8.00E-03	9.94E+00	4.72E-04	-1.05E-18	4.81E-04	0.4722	0.0000	0.4807
9	9.00E-03	1.01E+01	4.70E-04	-8.05E-19	5.43E-04	0.4701	0.0000	0.5426
10	1.00E-02	1.02E+01	4.68E-04	-5.61E-19	6.05E-04	0.4684	0.0000	0.6049
11	1.10E-02	1.03E+01	4.67E-04	-3.69E-19	6.68E-04	0.4669	0.0000	0.6676
12	1.20E-02	1.04E+01	4.66E-04	-1.68E-19	7.31E-04	0.4657	0.0000	0.7307
13	1.30E-02	1.05E+01	4.65E-04	3.73E-20	7.94E-04	0.4648	0.0000	0.7940
14	1.40E-02	1.06E+01	4.64E-04	3.44E-19	8.57E-04	0.4641	0.0000	0.8574
15	1.50E-02	1.06E+01	4.64E-04	8.44E-19	9.21E-04	0.4636	0.0000	0.9211
16	1.60E-02	1.06E+01	4.63E-04	1.90E-18	9.85E-04	0.4634	0.0000	0.9848
17	1.70E-02	3.06E-02	4.63E-04	3.85E-18	9.97E-04	0.4633	0.0000	0.9973
1	1.00E-03	1.03E+01	4.63E-04	2.09E-18	9.50E-04	0.4634	0.0000	0.9496
2	2.00E-03	1.06E+01	4.64E-04	1.02E-18	8.86E-04	0.4636	0.0000	0.8862
3	3.00E-03	1.06E+01	4.64E-04	6.55E-19	8.23E-04	0.4641	0.0000	0.8225
4	4.00E-03	1.05E+01	4.65E-04	4.65E-19	7.59E-04	0.4648	0.0000	0.7591
5	5.00E-03	1.05E+01	4.66E-04	2.56E-19	6.96E-04	0.4657	0.0000	0.6958
6	6.00E-03	1.04E+01	4.67E-04	6.79E-20	6.33E-04	0.4669	0.0000	0.6328
7	7.00E-03	1.03E+01	4.68E-04	-1.25E-19	5.70E-04	0.4684	0.0000	0.5701
8	8.00E-03	1.01E+01	4.70E-04	-3.03E-19	5.08E-04	0.4702	0.0000	0.5078
9	9.00E-03	1.00E+01	4.72E-04	-5.05E-19	4.46E-04	0.4722	0.0000	0.4459

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
9	9.00E-03	1.00E+01	4.72E-04	-5.05E-19	4.46E-04	0.4722	0.0000	0.4459
10	1.00E-02	9.85E+00	4.75E-04	-6.62E-19	3.84E-04	0.4747	0.0000	0.3845
11	1.10E-02	9.68E+00	4.77E-04	-7.93E-19	3.24E-04	0.4775	0.0000	0.3236
12	1.20E-02	9.49E+00	4.81E-04	-8.77E-19	2.63E-04	0.4807	0.0000	0.2633
13	1.30E-02	9.30E+00	4.84E-04	-9.95E-19	2.04E-04	0.4844	0.0000	0.2037
14	1.40E-02	9.09E+00	4.89E-04	-1.05E-18	1.45E-04	0.4886	0.0000	0.1448
15	1.50E-02	8.89E+00	4.93E-04	-7.81E-19	8.65E-05	0.4934	0.0000	0.0865
1	1.00E-03	8.45E+00	4.89E-04	-1.33E-18	1.30E-04	0.4894	0.0000	0.1297
2	2.00E-03	9.02E+00	4.85E-04	-1.57E-18	1.88E-04	0.4848	0.0000	0.1878
3	3.00E-03	9.23E+00	4.81E-04	-1.46E-18	2.47E-04	0.4807	0.0000	0.2468
4	4.00E-03	9.43E+00	4.77E-04	-1.35E-18	3.07E-04	0.4771	0.0000	0.3066
5	5.00E-03	9.62E+00	4.74E-04	-1.20E-18	3.67E-04	0.4740	0.0000	0.3670
6	6.00E-03	9.79E+00	4.71E-04	-1.08E-18	4.28E-04	0.4713	0.0000	0.4279
7	7.00E-03	9.95E+00	4.69E-04	-9.23E-19	4.89E-04	0.4689	0.0000	0.4894
8	8.00E-03	1.01E+01	4.67E-04	-7.59E-19	5.51E-04	0.4669	0.0000	0.5514
9	9.00E-03	1.02E+01	4.65E-04	-5.55E-19	6.14E-04	0.4652	0.0000	0.6138
10	1.00E-02	1.03E+01	4.64E-04	-3.69E-19	6.77E-04	0.4638	0.0000	0.6765
11	1.10E-02	1.04E+01	4.63E-04	-1.95E-19	7.40E-04	0.4626	0.0000	0.7396
12	1.20E-02	1.05E+01	4.62E-04	4.86E-20	8.03E-04	0.4618	0.0000	0.8029
13	1.30E-02	1.06E+01	4.61E-04	3.26E-19	8.66E-04	0.4611	0.0000	0.8664
14	1.40E-02	1.06E+01	4.61E-04	7.70E-19	9.30E-04	0.4607	0.0000	0.9300
15	1.50E-02	1.06E+01	4.60E-04	2.01E-18	9.94E-04	0.4605	0.0000	0.9938
1	1.00E-03	1.02E+01	4.61E-04	2.43E-19	9.46E-04	0.4605	0.0000	0.9460
2	2.00E-03	1.06E+01	4.61E-04	-8.76E-19	8.83E-04	0.4608	0.0000	0.8826
3	3.00E-03	1.06E+01	4.61E-04	-1.39E-18	8.19E-04	0.4612	0.0000	0.8190
4	4.00E-03	1.05E+01	4.62E-04	-1.65E-18	7.56E-04	0.4620	0.0000	0.7556
5	5.00E-03	1.05E+01	4.63E-04	-1.85E-18	6.92E-04	0.4629	0.0000	0.6923
6	6.00E-03	1.04E+01	4.64E-04	-2.10E-18	6.29E-04	0.4641	0.0000	0.6294

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
7	7.00E-03	1.03E+01	4.66E-04	-2.32E-18	5.67E-04	0.4656	0.0000	0.5667
8	8.00E-03	1.01E+01	4.67E-04	-2.54E-18	5.04E-04	0.4674	0.0000	0.5044
9	9.00E-03	9.99E+00	4.69E-04	-2.72E-18	4.43E-04	0.4694	0.0000	0.4425
10	1.00E-02	9.84E+00	4.72E-04	-2.94E-18	3.81E-04	0.4719	0.0000	0.3812
11	1.10E-02	9.66E+00	4.75E-04	-3.06E-18	3.20E-04	0.4747	0.0000	0.3204
12	1.20E-02	9.47E+00	4.78E-04	-3.14E-18	2.60E-04	0.4779	0.0000	0.2602
13	1.30E-02	9.28E+00	4.82E-04	-3.23E-18	2.01E-04	0.4816	0.0000	0.2006
14	1.40E-02	9.07E+00	4.86E-04	-3.24E-18	1.42E-04	0.4858	0.0000	0.1417
15	1.50E-02	8.87E+00	4.91E-04	-2.98E-18	8.36E-05	0.4907	0.0000	0.0836
1	1.00E-03	8.62E+00	4.82E-04	-3.37E-18	1.85E-04	0.4824	0.0000	0.1854
2	2.00E-03	9.21E+00	4.78E-04	-3.39E-18	2.44E-04	0.4782	0.0000	0.2441
3	3.00E-03	9.41E+00	4.75E-04	-3.28E-18	3.04E-04	0.4746	0.0000	0.3038
4	4.00E-03	9.60E+00	4.72E-04	-3.12E-18	3.64E-04	0.4715	0.0000	0.3641
5	5.00E-03	9.78E+00	4.69E-04	-2.96E-18	4.25E-04	0.4688	0.0000	0.4250
6	6.00E-03	9.94E+00	4.66E-04	-2.83E-18	4.86E-04	0.4664	0.0000	0.4865
7	7.00E-03	1.01E+01	4.64E-04	-2.59E-18	5.48E-04	0.4644	0.0000	0.5484
8	8.00E-03	1.02E+01	4.63E-04	-2.38E-18	6.11E-04	0.4627	0.0000	0.6108
9	9.00E-03	1.03E+01	4.61E-04	-2.21E-18	6.73E-04	0.4613	0.0000	0.6735
10	1.00E-02	1.04E+01	4.60E-04	-2.02E-18	7.37E-04	0.4601	0.0000	0.7365
11	1.10E-02	1.05E+01	4.59E-04	-1.76E-18	8.00E-04	0.4592	0.0000	0.7998
12	1.20E-02	1.06E+01	4.59E-04	-1.50E-18	8.63E-04	0.4586	0.0000	0.8633
13	1.30E-02	1.06E+01	4.58E-04	-1.07E-18	9.27E-04	0.4581	0.0000	0.9269
14	1.40E-02	1.06E+01	4.58E-04	5.55E-20	9.91E-04	0.4579	0.0000	0.9906
1	1.00E-03	1.02E+01	4.58E-04	-1.65E-18	9.43E-04	0.4580	0.0000	0.9429
2	2.00E-03	1.06E+01	4.58E-04	-2.73E-18	8.80E-04	0.4582	0.0000	0.8795
3	3.00E-03	1.06E+01	4.59E-04	-3.19E-18	8.16E-04	0.4587	0.0000	0.8159
4	4.00E-03	1.05E+01	4.59E-04	-3.45E-18	7.52E-04	0.4594	0.0000	0.7525
5	5.00E-03	1.05E+01	4.60E-04	-3.67E-18	6.89E-04	0.4604	0.0000	0.6893

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
7	7.00E-03	1.03E+01	4.63E-04	-4.07E-18	5.64E-04	0.4631	0.0000	0.5637
8	8.00E-03	1.01E+01	4.65E-04	-4.27E-18	5.01E-04	0.4649	0.0000	0.5014
9	9.00E-03	9.98E+00	4.67E-04	-4.41E-18	4.40E-04	0.4670	0.0000	0.4396
10	1.00E-02	9.82E+00	4.69E-04	-4.52E-18	3.78E-04	0.4694	0.0000	0.3783
11	1.10E-02	9.65E+00	4.72E-04	-4.65E-18	3.18E-04	0.4722	0.0000	0.3175
12	1.20E-02	9.46E+00	4.75E-04	-4.83E-18	2.57E-04	0.4755	0.0000	0.2573
13	1.30E-02	9.26E+00	4.79E-04	-4.94E-18	1.98E-04	0.4792	0.0000	0.1978
14	1.40E-02	9.06E+00	4.83E-04	-4.93E-18	1.39E-04	0.4834	0.0000	0.1390
15	1.50E-02	8.85E+00	4.88E-04	-4.58E-18	8.09E-05	0.4883	0.0000	0.0809

Table C-9 The position of toner trajectory at the cone depth of dented electrode 1.0mm and the applied voltage 1000V in unit (mm)

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
1	1.00E-03	6.86E-01	4.98E-04	-2.29E-19	1.12E-04	0.4976	0.0000	0.1121
2	2.00E-03	3.07E+00	4.92E-04	-9.84E-19	1.42E-04	0.4919	0.0000	0.1415
3	3.00E-03	3.22E+00	4.86E-04	-1.41E-18	1.76E-04	0.4858	0.0000	0.1758
4	4.00E-03	3.31E+00	4.80E-04	-1.55E-18	2.11E-04	0.4801	0.0000	0.2108
5	5.00E-03	3.40E+00	4.75E-04	-1.56E-18	2.46E-04	0.4748	0.0000	0.2463
6	6.00E-03	3.50E+00	4.70E-04	-1.49E-18	2.82E-04	0.4698	0.0000	0.2824
7	7.00E-03	3.60E+00	4.65E-04	-1.38E-18	3.19E-04	0.4652	0.0000	0.3191
8	8.00E-03	3.70E+00	4.61E-04	-1.23E-18	3.56E-04	0.4608	0.0000	0.3564
9	9.00E-03	3.81E+00	4.57E-04	-1.08E-18	3.94E-04	0.4568	0.0000	0.3941
10	1.00E-02	3.91E+00	4.53E-04	-9.42E-19	4.32E-04	0.4530	0.0000	0.4325
11	1.10E-02	4.01E+00	4.49E-04	-8.47E-19	4.71E-04	0.4495	0.0000	0.4713
12	1.20E-02	4.11E+00	4.46E-04	-7.71E-19	5.11E-04	0.4462	0.0000	0.5107

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
12	1.20E-02	4.11E+00	4.46E-04	-7.71E-19	5.11E-04	0.4462	0.0000	0.5107
13	1.30E-02	4.21E+00	4.43E-04	-6.67E-19	5.51E-04	0.4431	0.0000	0.5506
14	1.40E-02	4.31E+00	4.40E-04	-5.29E-19	5.91E-04	0.4402	0.0000	0.5909
15	1.50E-02	4.40E+00	4.38E-04	-4.32E-19	6.32E-04	0.4375	0.0000	0.6317
16	1.60E-02	4.49E+00	4.35E-04	-3.29E-19	6.73E-04	0.4351	0.0000	0.6730
17	1.70E-02	4.58E+00	4.33E-04	-1.76E-19	7.15E-04	0.4327	0.0000	0.7146
18	1.80E-02	4.66E+00	4.31E-04	-2.84E-21	7.57E-04	0.4306	0.0000	0.7567
19	1.90E-02	4.74E+00	4.29E-04	1.50E-19	7.99E-04	0.4286	0.0000	0.7991
20	2.00E-02	4.82E+00	4.27E-04	3.06E-19	8.42E-04	0.4267	0.0000	0.8419
21	2.10E-02	4.89E+00	4.25E-04	4.61E-19	8.85E-04	0.4250	0.0000	0.8850
22	2.20E-02	4.96E+00	4.23E-04	6.51E-19	9.28E-04	0.4235	0.0000	0.9285
23	2.30E-02	5.03E+00	4.22E-04	8.11E-19	9.72E-04	0.4220	0.0000	0.9722
24	2.40E-02	5.09E+00	4.21E-04	1.00E-18	1.02E-03	0.4207	0.0000	1.0162
25	2.50E-02	5.14E+00	4.20E-04	1.15E-18	1.06E-03	0.4195	0.0000	1.0604
26	2.60E-02	5.19E+00	4.18E-04	1.30E-18	1.10E-03	0.4185	0.0000	1.1049
27	2.70E-02	5.24E+00	4.18E-04	1.41E-18	1.15E-03	0.4175	0.0000	1.1496
28	2.80E-02	5.28E+00	4.17E-04	1.57E-18	1.19E-03	0.4167	0.0000	1.1945
29	2.90E-02	5.32E+00	4.16E-04	1.77E-18	1.24E-03	0.4160	0.0000	1.2395
30	3.00E-02	5.35E+00	4.15E-04	2.01E-18	1.28E-03	0.4154	0.0000	1.2846
31	3.10E-02	5.37E+00	4.15E-04	2.24E-18	1.33E-03	0.4149	0.0000	1.3299
32	3.20E-02	5.39E+00	4.15E-04	2.56E-18	1.38E-03	0.4145	0.0000	1.3753
33	3.30E-02	5.41E+00	4.14E-04	2.90E-18	1.42E-03	0.4143	0.0000	1.4207
34	3.40E-02	5.42E+00	4.14E-04	3.50E-18	1.47E-03	0.4141	0.0000	1.4662
1	1.00E-03	5.21E+00	4.14E-04	2.60E-18	1.43E-03	0.4142	0.0000	1.4322
2	2.00E-03	5.41E+00	4.14E-04	1.99E-18	1.39E-03	0.4143	0.0000	1.3869
3	3.00E-03	5.40E+00	4.15E-04	1.64E-18	1.34E-03	0.4146	0.0000	1.3415
4	4.00E-03	5.38E+00	4.15E-04	1.35E-18	1.30E-03	0.4150	0.0000	1.2962
5	5.00E-03	5.35E+00	4.16E-04	1.12E-18	1.25E-03	0.4155	0.0000	1.2509

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
6	6.00E-03	5.33E+00	4.16E-04	9.55E-19	1.21E-03	0.4162	0.0000	1.2058
7	7.00E-03	5.29E+00	4.17E-04	7.74E-19	1.16E-03	0.4169	0.0000	1.1608
8	8.00E-03	5.25E+00	4.18E-04	5.93E-19	1.12E-03	0.4178	0.0000	1.1160
9	9.00E-03	5.21E+00	4.19E-04	4.24E-19	1.07E-03	0.4187	0.0000	1.0713
10	1.00E-02	5.16E+00	4.20E-04	2.23E-19	1.03E-03	0.4198	0.0000	1.0269
11	1.10E-02	5.10E+00	4.21E-04	4.95E-20	9.83E-04	0.4210	0.0000	0.9827
12	1.20E-02	5.04E+00	4.22E-04	-1.69E-19	9.39E-04	0.4224	0.0000	0.9388
13	1.30E-02	4.98E+00	4.24E-04	-3.37E-19	8.95E-04	0.4238	0.0000	0.8951
14	1.40E-02	4.91E+00	4.25E-04	-4.64E-19	8.52E-04	0.4254	0.0000	0.8518
15	1.50E-02	4.84E+00	4.27E-04	-6.38E-19	8.09E-04	0.4272	0.0000	0.8087
16	1.60E-02	4.76E+00	4.29E-04	-7.82E-19	7.66E-04	0.4290	0.0000	0.7660
17	1.70E-02	4.68E+00	4.31E-04	-1.01E-18	7.24E-04	0.4311	0.0000	0.7237
18	1.80E-02	4.60E+00	4.33E-04	-1.20E-18	6.82E-04	0.4333	0.0000	0.6818
19	1.90E-02	4.51E+00	4.36E-04	-1.39E-18	6.40E-04	0.4356	0.0000	0.6402
20	2.00E-02	4.42E+00	4.38E-04	-1.58E-18	5.99E-04	0.4382	0.0000	0.5991
21	2.10E-02	4.33E+00	4.41E-04	-1.72E-18	5.58E-04	0.4409	0.0000	0.5584
22	2.20E-02	4.23E+00	4.44E-04	-1.85E-18	5.18E-04	0.4438	0.0000	0.5182
23	2.30E-02	4.13E+00	4.47E-04	-1.99E-18	4.79E-04	0.4469	0.0000	0.4785
24	2.40E-02	4.03E+00	4.50E-04	-2.11E-18	4.39E-04	0.4503	0.0000	0.4393
25	2.50E-02	3.93E+00	4.54E-04	-2.29E-18	4.01E-04	0.4539	0.0000	0.4006
26	2.60E-02	3.82E+00	4.58E-04	-2.40E-18	3.62E-04	0.4577	0.0000	0.3625
27	2.70E-02	3.72E+00	4.62E-04	-2.45E-18	3.25E-04	0.4618	0.0000	0.3249
28	2.80E-02	3.62E+00	4.66E-04	-2.55E-18	2.88E-04	0.4663	0.0000	0.2879
29	2.90E-02	3.52E+00	4.71E-04	-2.64E-18	2.51E-04	0.4710	0.0000	0.2514
30	3.00E-02	3.42E+00	4.76E-04	-2.68E-18	2.16E-04	0.4761	0.0000	0.2155
31	3.10E-02	3.32E+00	4.82E-04	-2.62E-18	1.80E-04	0.4815	0.0000	0.1802
32	3.20E-02	3.22E+00	4.87E-04	-2.45E-18	1.45E-04	0.4873	0.0000	0.1455
33	3.30E-02	3.14E+00	4.94E-04	-1.83E-18	1.11E-04	0.4935	0.0000	0.1113

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
34	3.40E-02	1.18E-03	4.95E-04	-2.36E-18	1.04E-04	0.4950	0.0000	0.1037
1	1.00E-03	2.96E+00	4.90E-04	-3.75E-18	1.29E-04	0.4900	0.0000	0.1289
2	2.00E-03	3.17E+00	4.84E-04	-4.55E-18	1.63E-04	0.4838	0.0000	0.1629
3	3.00E-03	3.27E+00	4.78E-04	-4.74E-18	1.98E-04	0.4779	0.0000	0.1976
4	4.00E-03	3.36E+00	4.73E-04	-4.71E-18	2.33E-04	0.4725	0.0000	0.2329
5	5.00E-03	3.46E+00	4.67E-04	-4.62E-18	2.69E-04	0.4674	0.0000	0.2687
6	6.00E-03	3.56E+00	4.63E-04	-4.50E-18	3.05E-04	0.4627	0.0000	0.3052
7	7.00E-03	3.66E+00	4.58E-04	-4.41E-18	3.42E-04	0.4583	0.0000	0.3422
8	8.00E-03	3.76E+00	4.54E-04	-4.32E-18	3.80E-04	0.4541	0.0000	0.3797
9	9.00E-03	3.86E+00	4.50E-04	-4.19E-18	4.18E-04	0.4503	0.0000	0.4178
10	1.00E-02	3.97E+00	4.47E-04	-4.09E-18	4.56E-04	0.4467	0.0000	0.4565
11	1.10E-02	4.07E+00	4.43E-04	-4.01E-18	4.96E-04	0.4433	0.0000	0.4956
12	1.20E-02	4.17E+00	4.40E-04	-3.85E-18	5.35E-04	0.4402	0.0000	0.5353
13	1.30E-02	4.26E+00	4.37E-04	-3.69E-18	5.75E-04	0.4373	0.0000	0.5754
14	1.40E-02	4.36E+00	4.35E-04	-3.52E-18	6.16E-04	0.4345	0.0000	0.6160
15	1.50E-02	4.45E+00	4.32E-04	-3.37E-18	6.57E-04	0.4320	0.0000	0.6571
16	1.60E-02	4.54E+00	4.30E-04	-3.21E-18	6.99E-04	0.4296	0.0000	0.6986
17	1.70E-02	4.63E+00	4.27E-04	-3.00E-18	7.40E-04	0.4274	0.0000	0.7405
18	1.80E-02	4.71E+00	4.25E-04	-2.84E-18	7.83E-04	0.4254	0.0000	0.7827
19	1.90E-02	4.79E+00	4.24E-04	-2.72E-18	8.25E-04	0.4235	0.0000	0.8254
20	2.00E-02	4.86E+00	4.22E-04	-2.58E-18	8.68E-04	0.4218	0.0000	0.8684
21	2.10E-02	4.93E+00	4.20E-04	-2.45E-18	9.12E-04	0.4202	0.0000	0.9117
22	2.20E-02	5.00E+00	4.19E-04	-2.27E-18	9.55E-04	0.4187	0.0000	0.9553
23	2.30E-02	5.06E+00	4.17E-04	-2.09E-18	9.99E-04	0.4173	0.0000	0.9992
24	2.40E-02	5.12E+00	4.16E-04	-1.97E-18	1.04E-03	0.4161	0.0000	1.0433
25	2.50E-02	5.17E+00	4.15E-04	-1.79E-18	1.09E-03	0.4150	0.0000	1.0877
26	2.60E-02	5.22E+00	4.14E-04	-1.59E-18	1.13E-03	0.4141	0.0000	1.1323
27	2.70E-02	5.26E+00	4.13E-04	-1.42E-18	1.18E-03	0.4132	0.0000	1.1771

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
28	2.80E-02	5.30E+00	4.12E-04	-1.21E-18	1.22E-03	0.4124	0.0000	1.2220
29	2.90E-02	5.33E+00	4.12E-04	-9.43E-19	1.27E-03	0.4118	0.0000	1.2671
30	3.00E-02	5.36E+00	4.11E-04	-6.77E-19	1.31E-03	0.4113	0.0000	1.3124
31	3.10E-02	5.38E+00	4.11E-04	-4.16E-19	1.36E-03	0.4109	0.0000	1.3577
32	3.20E-02	5.40E+00	4.11E-04	-7.66E-20	1.40E-03	0.4106	0.0000	1.4031
33	3.30E-02	5.41E+00	4.10E-04	4.20E-19	1.45E-03	0.4104	0.0000	1.4485
34	3.40E-02	5.42E+00	4.10E-04	1.56E-18	1.49E-03	0.4103	0.0000	1.4940
1	1.00E-03	5.22E+00	4.10E-04	-1.37E-18	1.46E-03	0.4102	0.0000	1.4600
2	2.00E-03	5.41E+00	4.10E-04	-2.35E-18	1.41E-03	0.4103	0.0000	1.4147
3	3.00E-03	5.40E+00	4.11E-04	-2.81E-18	1.37E-03	0.4105	0.0000	1.3693
4	4.00E-03	5.39E+00	4.11E-04	-3.14E-18	1.32E-03	0.4108	0.0000	1.3239
5	5.00E-03	5.37E+00	4.11E-04	-3.38E-18	1.28E-03	0.4113	0.0000	1.2786
6	6.00E-03	5.34E+00	4.12E-04	-3.60E-18	1.23E-03	0.4118	0.0000	1.2334
7	7.00E-03	5.31E+00	4.12E-04	-3.82E-18	1.19E-03	0.4125	0.0000	1.1883
8	8.00E-03	5.27E+00	4.13E-04	-4.01E-18	1.14E-03	0.4133	0.0000	1.1434
9	9.00E-03	5.23E+00	4.14E-04	-4.20E-18	1.10E-03	0.4142	0.0000	1.0987
10	1.00E-02	5.19E+00	4.15E-04	-4.37E-18	1.05E-03	0.4152	0.0000	1.0541
11	1.10E-02	5.13E+00	4.16E-04	-4.56E-18	1.01E-03	0.4163	0.0000	1.0098
12	1.20E-02	5.08E+00	4.18E-04	-4.78E-18	9.66E-04	0.4175	0.0000	0.9657
13	1.30E-02	5.02E+00	4.19E-04	-4.87E-18	9.22E-04	0.4189	0.0000	0.9219
14	1.40E-02	4.95E+00	4.20E-04	-4.99E-18	8.78E-04	0.4204	0.0000	0.8784
15	1.50E-02	4.88E+00	4.22E-04	-5.17E-18	8.35E-04	0.4220	0.0000	0.8351
16	1.60E-02	4.81E+00	4.24E-04	-5.35E-18	7.92E-04	0.4238	0.0000	0.7922
17	1.70E-02	4.73E+00	4.26E-04	-5.52E-18	7.50E-04	0.4257	0.0000	0.7497
18	1.80E-02	4.65E+00	4.28E-04	-5.66E-18	7.08E-04	0.4278	0.0000	0.7075
19	1.90E-02	4.56E+00	4.30E-04	-5.85E-18	6.66E-04	0.4301	0.0000	0.6657
20	2.00E-02	4.47E+00	4.32E-04	-6.06E-18	6.24E-04	0.4325	0.0000	0.6244
21	2.10E-02	4.38E+00	4.35E-04	-6.22E-18	5.83E-04	0.4350	0.0000	0.5835

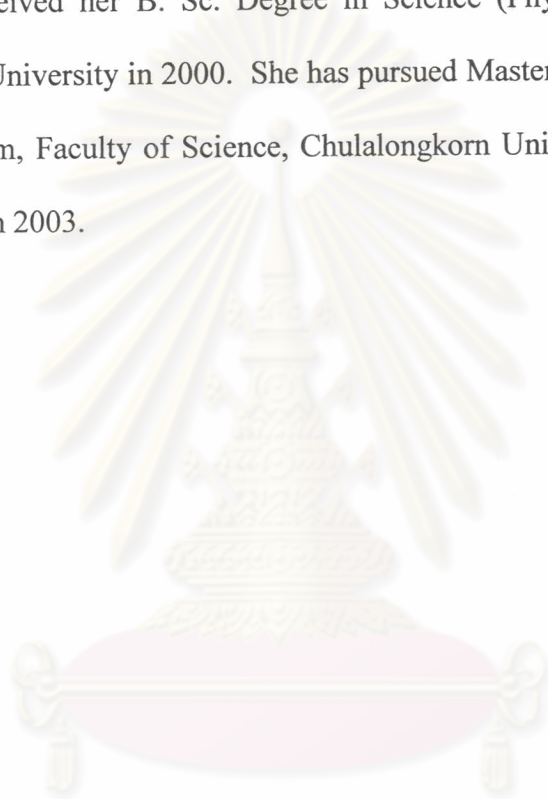
STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
22	2.20E-02	4.29E+00	4.38E-04	-6.37E-18	5.43E-04	0.4378	0.0000	0.5430
23	2.30E-02	4.19E+00	4.41E-04	-6.54E-18	5.03E-04	0.4408	0.0000	0.5030
24	2.40E-02	4.09E+00	4.44E-04	-6.69E-18	4.64E-04	0.4440	0.0000	0.4635
25	2.50E-02	3.99E+00	4.47E-04	-6.86E-18	4.25E-04	0.4474	0.0000	0.4245
26	2.60E-02	3.88E+00	4.51E-04	-7.05E-18	3.86E-04	0.4511	0.0000	0.3861
27	2.70E-02	3.78E+00	4.55E-04	-7.26E-18	3.48E-04	0.4550	0.0000	0.3481
28	2.80E-02	3.67E+00	4.59E-04	-7.45E-18	3.11E-04	0.4592	0.0000	0.3108
29	2.90E-02	3.57E+00	4.64E-04	-7.64E-18	2.74E-04	0.4637	0.0000	0.2740
30	3.00E-02	3.47E+00	4.69E-04	-7.77E-18	2.38E-04	0.4685	0.0000	0.2378
31	3.10E-02	3.37E+00	4.74E-04	-7.91E-18	2.02E-04	0.4737	0.0000	0.2022
32	3.20E-02	3.27E+00	4.79E-04	-7.88E-18	1.67E-04	0.4792	0.0000	0.1671
33	3.30E-02	3.18E+00	4.85E-04	-7.59E-18	1.33E-04	0.4852	0.0000	0.1327
34	3.40E-02	3.10E+00	4.92E-04	-6.54E-18	9.87E-05	0.4916	0.0000	0.0987
1	1.00E-03	2.94E+00	4.87E-04	-8.11E-18	1.24E-04	0.4866	0.0000	0.1238
2	2.00E-03	3.15E+00	4.80E-04	-8.96E-18	1.58E-04	0.4803	0.0000	0.1577
3	3.00E-03	3.24E+00	4.74E-04	-9.18E-18	1.92E-04	0.4745	0.0000	0.1922
4	4.00E-03	3.34E+00	4.69E-04	-9.19E-18	2.27E-04	0.4690	0.0000	0.2274
5	5.00E-03	3.43E+00	4.64E-04	-9.11E-18	2.63E-04	0.4639	0.0000	0.2631
6	6.00E-03	3.53E+00	4.59E-04	-8.97E-18	2.99E-04	0.4592	0.0000	0.2994
7	7.00E-03	3.64E+00	4.55E-04	-8.81E-18	3.36E-04	0.4547	0.0000	0.3363
8	8.00E-03	3.74E+00	4.51E-04	-8.67E-18	3.74E-04	0.4506	0.0000	0.3738
9	9.00E-03	3.84E+00	4.47E-04	-8.51E-18	4.12E-04	0.4467	0.0000	0.4117
10	1.00E-02	3.94E+00	4.43E-04	-8.37E-18	4.50E-04	0.4431	0.0000	0.4503
11	1.10E-02	4.05E+00	4.40E-04	-8.21E-18	4.89E-04	0.4397	0.0000	0.4893
12	1.20E-02	4.15E+00	4.37E-04	-8.01E-18	5.29E-04	0.4366	0.0000	0.5289
13	1.30E-02	4.24E+00	4.34E-04	-7.81E-18	5.69E-04	0.4336	0.0000	0.5689
14	1.40E-02	4.34E+00	4.31E-04	-7.65E-18	6.09E-04	0.4309	0.0000	0.6094
15	1.50E-02	4.43E+00	4.28E-04	-7.49E-18	6.50E-04	0.4284	0.0000	0.6504

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
16	1.60E-02	4.52E+00	4.26E-04	-7.34E-18	6.92E-04	0.4260	0.0000	0.6918
17	1.70E-02	4.61E+00	4.24E-04	-7.15E-18	7.34E-04	0.4238	0.0000	0.7336
18	1.80E-02	4.69E+00	4.22E-04	-7.00E-18	7.76E-04	0.4217	0.0000	0.7758
19	1.90E-02	4.77E+00	4.20E-04	-6.82E-18	8.18E-04	0.4198	0.0000	0.8184
20	2.00E-02	4.85E+00	4.18E-04	-6.62E-18	8.61E-04	0.4181	0.0000	0.8613
21	2.10E-02	4.92E+00	4.16E-04	-6.44E-18	9.05E-04	0.4165	0.0000	0.9046
22	2.20E-02	4.99E+00	4.15E-04	-6.28E-18	9.48E-04	0.4150	0.0000	0.9481
23	2.30E-02	5.05E+00	4.14E-04	-6.10E-18	9.92E-04	0.4136	0.0000	0.9920
24	2.40E-02	5.11E+00	4.12E-04	-5.93E-18	1.04E-03	0.4124	0.0000	1.0360
25	2.50E-02	5.16E+00	4.11E-04	-5.75E-18	1.08E-03	0.4113	0.0000	1.0804
26	2.60E-02	5.21E+00	4.10E-04	-5.55E-18	1.12E-03	0.4103	0.0000	1.1249
27	2.70E-02	5.25E+00	4.09E-04	-5.37E-18	1.17E-03	0.4094	0.0000	1.1697
28	2.80E-02	5.29E+00	4.09E-04	-5.20E-18	1.21E-03	0.4087	0.0000	1.2146
29	2.90E-02	5.33E+00	4.08E-04	-5.01E-18	1.26E-03	0.4080	0.0000	1.2597
30	3.00E-02	5.35E+00	4.07E-04	-4.74E-18	1.30E-03	0.4075	0.0000	1.3049
31	3.10E-02	5.38E+00	4.07E-04	-4.50E-18	1.35E-03	0.4071	0.0000	1.3502
32	3.20E-02	5.40E+00	4.07E-04	-4.16E-18	1.40E-03	0.4067	0.0000	1.3955
33	3.30E-02	5.41E+00	4.07E-04	-3.65E-18	1.44E-03	0.4065	0.0000	1.4410
34	3.40E-02	5.42E+00	4.06E-04	-2.61E-18	1.49E-03	0.4064	0.0000	1.4864
35	3.50E-02	3.61E-02	4.07E-04	-9.81E-19	1.49E-03	0.4065	0.0000	1.4944
1	1.00E-03	5.21E+00	4.06E-04	-2.30E-18	1.46E-03	0.4064	0.0000	1.4604
2	2.00E-03	5.41E+00	4.06E-04	-3.24E-18	1.42E-03	0.4065	0.0000	1.4152
3	3.00E-03	5.40E+00	4.07E-04	-3.72E-18	1.37E-03	0.4067	0.0000	1.3697
4	4.00E-03	5.39E+00	4.07E-04	-4.06E-18	1.32E-03	0.4070	0.0000	1.3243
5	5.00E-03	5.37E+00	4.07E-04	-4.36E-18	1.28E-03	0.4075	0.0000	1.2791
6	6.00E-03	5.34E+00	4.08E-04	-4.65E-18	1.23E-03	0.4080	0.0000	1.2339
7	7.00E-03	5.31E+00	4.09E-04	-4.91E-18	1.19E-03	0.4087	0.0000	1.1888
8	8.00E-03	5.27E+00	4.09E-04	-5.17E-18	1.14E-03	0.4094	0.0000	1.1439

STEP	-TIME-	-V-	-X-	-Y-	-Z-	-X-	-Y-	-Z-
9	9.00E-03	5.23E+00	4.10E-04	-5.39E-18	1.10E-03	0.4103	0.0000	1.0992
10	1.00E-02	5.18E+00	4.11E-04	-5.59E-18	1.05E-03	0.4113	0.0000	1.0546
11	1.10E-02	5.13E+00	4.12E-04	-5.83E-18	1.01E-03	0.4124	0.0000	1.0103
12	1.20E-02	5.08E+00	4.14E-04	-6.02E-18	9.66E-04	0.4137	0.0000	0.9662
13	1.30E-02	5.02E+00	4.15E-04	-6.21E-18	9.22E-04	0.4150	0.0000	0.9224
14	1.40E-02	4.95E+00	4.17E-04	-6.39E-18	8.79E-04	0.4165	0.0000	0.8789
15	1.50E-02	4.88E+00	4.18E-04	-6.56E-18	8.36E-04	0.4181	0.0000	0.8357
16	1.60E-02	4.81E+00	4.20E-04	-6.76E-18	7.93E-04	0.4199	0.0000	0.7928
17	1.70E-02	4.73E+00	4.22E-04	-6.98E-18	7.50E-04	0.4218	0.0000	0.7503
18	1.80E-02	4.65E+00	4.24E-04	-7.18E-18	7.08E-04	0.4238	0.0000	0.7081
19	1.90E-02	4.56E+00	4.26E-04	-7.40E-18	6.66E-04	0.4261	0.0000	0.6663
20	2.00E-02	4.47E+00	4.28E-04	-7.63E-18	6.25E-04	0.4284	0.0000	0.6250
21	2.10E-02	4.38E+00	4.31E-04	-7.85E-18	5.84E-04	0.4310	0.0000	0.5841
22	2.20E-02	4.28E+00	4.34E-04	-8.04E-18	5.44E-04	0.4338	0.0000	0.5436
23	2.30E-02	4.18E+00	4.37E-04	-8.22E-18	5.04E-04	0.4367	0.0000	0.5036
24	2.40E-02	4.08E+00	4.40E-04	-8.40E-18	4.64E-04	0.4399	0.0000	0.4641
25	2.50E-02	3.98E+00	4.43E-04	-8.57E-18	4.25E-04	0.4432	0.0000	0.4252
26	2.60E-02	3.88E+00	4.47E-04	-8.73E-18	3.87E-04	0.4469	0.0000	0.3867
27	2.70E-02	3.77E+00	4.51E-04	-8.95E-18	3.49E-04	0.4508	0.0000	0.3488
28	2.80E-02	3.67E+00	4.55E-04	-9.12E-18	3.11E-04	0.4549	0.0000	0.3115
29	2.90E-02	3.57E+00	4.59E-04	-9.24E-18	2.75E-04	0.4594	0.0000	0.2747
30	3.00E-02	3.46E+00	4.64E-04	-9.38E-18	2.39E-04	0.4642	0.0000	0.2385
31	3.10E-02	3.36E+00	4.69E-04	-9.53E-18	2.03E-04	0.4694	0.0000	0.2029
32	3.20E-02	3.27E+00	4.75E-04	-9.51E-18	1.68E-04	0.4749	0.0000	0.1679
33	3.30E-02	3.17E+00	4.81E-04	-9.18E-18	1.33E-04	0.4808	0.0000	0.1335
34	3.40E-02	3.09E+00	4.87E-04	-8.13E-18	9.96E-05	0.4871	0.0000	0.0996

VITA

Miss Witchanikul Sripho was born on January 4, 1978 in Nakhonratchasima, Thailand. She received her B. Sc. Degree in Science (Physics) from Faculty of Science Silpakorn University in 2000. She has pursued Master of Science in Imaging Technology Program, Faculty of Science, Chulalongkorn University since 2001 and finished her study in 2003.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย