



## CHAPTER V

# CONCLUSION AND RECOMMENDATION

### 5.1 Conclusion

In this thesis, we deal with the analysis of edge slot using the combined finite element and moment methods. The mathematical derivation of the analysis can be successfully derived as mentioned in detail in chapter 3. The singular element was proposed to overcome the singularity problem due to the presence of the corners on the domain of problem that generally decreases the accuracy and the convergence of the analysis.

The calculation of electric field distribution obtains a proper sinusoidal manner that is agree with the theory of slot antenna. However, the application of singular element shape function undesirably yields the result that is quite larger than the reference with the standard element. This undesired result is mainly caused by the unsuitability of the application of element shape function for the combined finite element and moment methods if the singular point lies on the surface that have to be derived by moment method. incompatibility in the moment method portion. So that the change of basis function on the moment method portion that affects to the whole nodal calculation instead of local element as in the finite element portion.

The admittance properties of edge slot which is calculated from the obtained electric field distribution have a proper curve and have value larger than the calculation with zero wall thickness, but it is a bit less than the result on the references that include the wall thickness.

The radiation pattern of an edge slot is successfully derived from the result of electric field distribution by neglecting the diffraction effect of waveguide walls and excluding the scattered field on the backward half space. The pattern is closed to the half wavelength dipole antenna, but less directivity due to the parts of slot that

wrap on the broad wall.

## **5.2 Recommendation**

The numerical study of the edge slot is so important to predict some required parameters needed on the practical design. Therefore, it is highly recommended to study more deeper on this field.

The improper result of the singular element implementation is can be tried to be improved by another formula of singular element that has a suitable characteristic to work on the combined method.

Another idea on the analysis of edge slot is to apply the pure finite element method by enforcing the absorbing boundary condition for the region outside the waveguide. This probably can get a good result and avoid the used of external Green's function that so complicated to be calculated and causes the increment of the calculation time.