

## C615450 : MAJOR ELECTRICAL ENGINEERING

KEY WORD: WAVEGUIDE / FINITE ELEMENT

CHAIRAT PINTHONG : EFFICIENCY OF FINITE ELEMENT ANALYSIS OF EIGENMODES IN LOSSLESS ANISOTROPIC WAVEGUIDES.

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This thesis has the objective on efficiency comparison of the finite element analysis of eigenmodes in lossless anisotropic waveguides, which are well known and widely accepted in the past decade. These proposed methods are

1. Finite Element Method (FEM) using three magnetic field components.
2. FEM using three electric field components.
3. FEM using transverse magnetic field components.
4. FEM using transverse electric field components.
5. FEM using tangential and axial electric field components.
6. FEM using transverse electric and magnetic field components.

In this thesis, all 6 methods mentioned above have been reviewed and tested by the same numerical examples. The result of comparison shows that the FEM using tangential and axial electric field components, with some modification by the author of this thesis, has the highest efficiency among other methods in analyzing lossless anisotropic waveguides.

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