

We investigate numerical solution of two-dimensional Maxwell's equations in heterogeneous media (Maxwell's interface problems), where the permeability and permittivity are piecewise constant. Based on Hodge decomposition for divergence free vector fields, Maxwell's interface problems are reformulated as two second order elliptic interface problems. These elliptic interface problems are solved by combining full multigrid methodology, the singular function representation of the solution and the extraction formulas for stress intensity factors. This new approach is demonstrated by P1 finite element method on quasi-uniform grids.