FINITE ELEMENT METHODS FOR A FOURTH ORDER CURL OPERATOR ON PLANAR DOMAINS

Li-yeng Sung*

*Department of Mathematics and Center for Compuation & Technology
Louisiana State University, Baton Rouge, LA 70803, USA
sung@math.lsu.edu

ABSTRACT

We extend our earlier work on Maxwell equations [1] to the source problem and eigenvalue problems for a fourth order curl operator on planar domains. We will present theoretical and numerical results for new finite element methods that are based on standard Lagrange finite elements for second order scalar problems. These methods are derived through the Hodge decomposition of divergence free vector fields. This is joint work with Susanne C Brenner and Jiguang Sun.

REFERENCES

[1] Brenner, S.C., Cui, J., Nan, Z. and Sung, L.-Y. Hodge decomposition for divergence-free vector fields and two-dimensional Maxwell's equations. *Math. Comp.* (2012) **81**:643–659.