1033-35-23   **Kathryn A Trapp*** (`ktrapp@richmond.edu`), Mathematics and Computer Science Dept., 212 Jepson Hall, University of Richmond, Richmond, VA 23173. *Compatible Spatial Discretizations and Discrete Exact Sequences.*

Compatible discretization methods for solving partial differential equations are often used in electromagnetics to preserve the underlying physical properties expressed in the equations. The mimetic method and the covolume method are two compatible discretization methods that rely on a discrete vector calculus structure. These two numerical methods may be placed in a common framework through the use of discrete differential complexes. In this talk we describe this framework in two and three dimensions, how it captures fundamental relationships among first- order differential operators, and how these methods can be extended to higher-order discretization methods for solving div-curl systems. (Received July 20, 2007)