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Minah Oh*, Department of Mathematics and Statistics, 305 Roop Hall, MSC 1911, James Madison University, Harrisonburg, VA 22807. *A New Approach to the Finite Element Analysis of Axisymmetric Problems.*

Three-dimensional axisymmetric problems can be reduced to a two-dimensional (2D) problem via cylindrical coordinates. This is an attractive feature, since it reduces computational time significantly. The difficulty is that the analysis of the resulting 2D problem involves weighted Sobolev spaces where the weight function is the radial component r . In this talk, we will discuss a new approach to the finite element analysis of axisymmetric problems: FEEC (Finite Element Exterior Calculus). In particular, we will discuss the axisymmetric Hodge Laplacian. The construction of bounded cochain projections in appropriate weighted spaces is the key idea. (Received September 24, 2012)