1145-65-1068 **Minah Oh*** (ohmx@jmu.edu). *The Hodge Laplacian on Axisymmetric Domains.*

An axisymmetric problem is a problem defined on a three-dimensional (3D) axisymmetric domain, and it appears in numerous applications. An axisymmetric problem can be reduced to a sequence of two-dimensional (2D) problems by using cylindrical coordinates and a Fourier series decomposition. A discrete problem corresponding to the 2D problem is significantly smaller than that corresponding to the 3D one, so such dimension reduction is an attractive feature considering computation time. Due to the Jacobian arising from change of variables, however, the resulting 2D problems are posed in weighted function spaces where the weight function is the radial component r. Furthermore, formulas of the grad, curl, and div operators resulting from the so-called Fourier finite element methods are quite different from the standard ones, and it is well-known that these operators do not map the standard polynomial spaces into the next one. In this talk, I will present stability and convergence results of the mixed formulations arising from the axisymmetric Hodge Laplacian by using a relatively new family of finite element spaces that forms an exact sequence and that satisfies the abstract Hilbert space framework developed by Arnold, Falk, and Winther. (Received September 18, 2018)