1086-35-2601 **Ryan Szypowski*** (rsszypowski@csupomona.edu), 3801 West Temple Ave, Pomona, CA 91768, and **Mike Holst** and **Andrew Gillette**. *Adaptive FEEC for Nonlinear Geometric PDEs.* Preliminary report.

The adaptive finite element method, based on the standard SOLVE -> ESTIMATE -> MARK -> REFINE loop, is well understood for standard finite element approximations of general nonlinear PDEs satisfying appropriate assumptions on the nonlinearity. In this talk, we will present some early numerical and analytic results for incorporating this same approach to adaptivity to the finite element exterior calculus framework. This framework is developed for the approximation of solutions to PDEs defined in the context of a Hilbert complex, and is useful in understanding many PDEs with geometric underpinnings. Here, we will mostly restrict our attention to the Hodge-Laplacian defined on a smooth 2-surface as our model problem. The development is based on results for adaptive finite element approximations applied to a mixed method for the standard Laplace equation. (Received September 25, 2012)