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Vitor Leite Nunes* (vitor@vt.edu), Interdisciplinary Center for Applied Mathemat, Virginia Polytechnic Institute & State Univer, Wright House (0531), West Campus Drive, blacksburg, VA 24060. *Frechet Sensitivity Analysis for the Convection-Diffusion Equation.*

In this work, we consider Fréchet derivatives of solutions to the convection-diffusion equation with respect to parameters and demonstrate their applicability in parameter estimation. This includes showing that the Fréchet derivative operator is Hilbert-Schmidt and the implications for uncertainty quantification. In addition to numerical results, we introduce a finite dimensional representation of the operator, and discuss sufficient conditions for the convergence of finite dimensional singular values to their infinite dimensional counterparts. (Received August 18, 2011)