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Edward J Fuselier* (efuselier@highpoint.edu), Department of Mathematics & Computer Science, High Point University, 833 Montlieu Ave., High Point, NC 27262. *RBF-generated discrete differential operators on surfaces and applications to partial differential equations.*

A kernel-based method has recently been proposed for solving parabolic partial differential equations (PDEs) on surfaces. The method uses a semi-discrete approach by replacing the surface-differential operators that appear in the PDEs with discrete versions, which one constructs using kernel-based collocation. In this talk we discuss how to produce these operators using radial basis functions (RBFs) and derive error estimates between each discrete differential operator and its continuous counterpart. We also present numerical results relevant to the efficacy of using these operators to solve certain parabolic PDEs, and end with some open questions. (Received December 10, 2011)