## 1069-65-154 Greg Fasshauer\* (fasshauer@iit.edu), Chicago, IL 60564, and Mike McCourt. Stable Evaluation of Gaussian RBF Interpolants.

We present a new way to compute and evaluate Gaussian radial basis function interpolants in a stable way also for small values of the shape parameter, i.e., for "flat" kernels. This work is motivated by the fundamental ideas proposed earlier by Bengt Fornberg and his co-workers. However, following Mercer's theorem, an  $L_2(\mathbb{R}^d, \rho)$ -orthonormal expansion of the Gaussian kernel allows us to come up with an algorithm that is simpler than the one proposed by Fornberg, Larsson and Flyer and that is applicable in arbitrary space dimensions d. (Received January 21, 2011)