1067-41-1937   **Yuliya Babenko*** (`ybabenko@kennesaw.edu`), Department of Mathematics and Statistics, Kennesaw State University, 1000 Chastain Road, #1204, Kennesaw, GA 30144, and **Tatyana Leskevich**. *Exact asymptotics of the error of adaptive approximation by harmonic splines.*

Approximation by various types of splines is one of the standard procedure in many applications. In all these applications, there is a standard distinction between uniform and adaptive methods. In the uniform case, the domain of interest is decomposed into a partition where elements do not vary much. Adaptive partitions take into consideration local variations in the function behavior and therefore provide more accurate approximations. However, no polynomial time algorithm exists to provide an optimal approximant for each given function. Therefore, the next natural question would be to construct asymptotically optimal sequences of partitions and approximants on them. In this talk, first we shall briefly present a general scheme for obtaining the asymptotical estimates for the error of interpolation and approximation by splines in various settings (bivariate as well as multivariate). Then we shall introduce our recent results on sharp asymtotics of the interpolation error by polynomial splines on box partitions. However, polynomial splines are not always the optimal choice in multivariate case, and (poly)harmonic splines can be a more natural interpolation tool. We will present the sharp asymptotics of the error of approximation by interpolating harmonic splines. (Received September 22, 2010)

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