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Dmitriy Bilyk* (dbilyk@math.umn.edu), School of Mathematics, University of Minnesota, 206 Church St. SE, Minneapolis, MN 55455. *Discrepancies with respect to various set systems.*

Discrepancy is a natural way to measure the extent of uniformity of a finite distribution by comparing the generated empirical measure to the Lebesgue measure over a certain family of sets. It is well-known that the arising estimates heavily depend on the geometry of the underlying sets. For example, fixed-direction rectangles on one hand, and arbitrarily rotated rectangles or discs on the other yield completely different asymptotics. We try to deeper understand these phenomena, obtain intermediate estimates, and relate these questions to other problems. The methods of Fourier analysis and number theory turn out to be crucial. Part of this talk is based on joint work with X. Ma, J. Pipher, C. Spencer. (Received September 03, 2012)