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Abstract

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Convex hulls of perturbed random point sets

Joint with J. E. Yukich

We start from a random point set which is in convex position and we add independently a random perturbation to each point, either uniform or Gaussian. This perturbation may be considered as an error or a noise. We then investigate the convex hull of this new random input and in particular its number of k-dimensional faces. The growth rate depends on the 'size' of the perturbation measured by a certain power and we identify the exact phase transitions. In each regime, we show scaling limits, expectation and variance asymptotics as well as a central limit theorem.