Volume thresholds for Gaussian and spherical random polytopes and their duals

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Let g be a Gaussian random vector in $\mathbb{R}^n$. Let $N = N(n)$ be a positive integer and denote by K_N the convex hull of N independent copies of g. Fix $R > 0$ and consider the ratio of volumes $V_N := \mathbb{E}\,\mathrm{vol}(K_N \cap RB_2^n)/\mathrm{vol}(RB_2^n)$. I will discuss a family of results involving sharp thresholds for N, above which $V_N \to 1$ as $n \to \infty$, and below which $V_N \to 0$ as $n \to \infty$. I shall also discuss the case when K_N is the convex hull of independent random vectors distributed uniformly on the Euclidean sphere. Complementary results for polytopes generated by random facets will also be presented. This work was motivated by recent results of Gatzouras and Giannopoulos and uses the method developed by Dyer, Füredi and McDiarmid.