

Deviation Probabilities for APs and other regular structures

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Let \mathcal{H} be a k -uniform hypergraph on a vertex set V and B_m be a uniformly sampled m -set from V . Set X to be the random variable given by the number of edges induced by the set B_m . We provide tight upperbounds (up to a constant in the exponent) for the tail distribution of $X - \mathbb{E}[X]$ for a wide range of deviations, provided some near regularity conditions are satisfied by the hypergraph \mathcal{H} . In particular, the bounds may be applied to the setting of arithmetic progressions and more generally to solutions of linear systems.

This is joint work with Gonzalo Fiz Pontiveros, Simon Griffiths and Oriol Serra.