

# Independent Sets in the Hypercube Revisited

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We revisit Sapozhenko's classic proof on the asymptotics of the number of independent sets in the discrete hypercube and Galvin's follow-up work on weighted independent sets. We combine Sapozhenko's graph container methods with the cluster expansion and abstract polymer models, two tools from statistical physics, to obtain considerably sharper asymptotics and detailed probabilistic information about the typical structure of (weighted) independent sets in the hypercube. These results refine those of Korshunov and Sapozhenko and Galvin, and answer several questions of Galvin. Joint work with Matthew Jenssen.