2. Random 0/1 polytopes

Let $g(n) := \max\{f_{n-1}(P_n) : P_n$ a 0/1 polytope in $\mathbb{R}^n\}$, where f_{n-1} denotes the number of facets. Bárány and Pór proved that $g(n) \geq \left(\frac{cn}{\log n}\right)^{n/4}$, where $c > 0$ is an absolute constant. We show that the exponent $n/4$ can in fact be improved to $n/2$: There exists a constant $c > 0$ such that

$$g(n) \geq \left(\frac{cn}{\log n}\right)^{n/2}.$$

The result is established by a refinement of the probabilistic method developed by Bárány and Pór (joint work with D. Gatzouras and N. Markoulakis).