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Hypercube percolation

Consider percolation on the Hamming cube $\{0, 1\}^n$ at the critical probability p_c (at which the expected cluster size is $2^{n/3}$). It is known that if $p = p_c(1 + O(2^{-n/3}))$, then the largest component is of size roughly $2^{2n/3}$ with high probability and that this quantity is non-concentrated. We show that for any sequence $\epsilon(n)$ such that $\epsilon(n) \gg 2^{-n/3}$ and $\epsilon(n) = o(1)$ percolation at $p_c(1 + \epsilon(n))$ yields a largest cluster of size $(2 + o(1))\epsilon(n)2^n$.

This result settles a conjecture of Borgs, Chayes, van der Hofstad, Slade and Spencer.

Joint work with Remco van der Hofstad.