Minors in random regular graphs. (English) Zbl 1201.05086

Summary: We show that there is a constant $c$ so that for fixed $r \geq 3$ a.a.s. an $r$-regular graph on $n$ vertices contains a complete graph on $c\sqrt{n}$ vertices as a minor. This confirms a conjecture of K. Markström [“Complete minors in cubic graphs with few short cycles and random cubic graphs,” Ars Comb. 70, 289–295 (2004; Zbl 1092.05063)]. Since any minor of an $r$-regular graph on $n$ vertices has at most $rn^2/2$ edges, our bound is clearly best possible up to the value of the constant $c$. As a corollary, we also obtain the likely order of magnitude of the largest complete minor in a random graph $G_{n,p}$ during the phase transition (i.e., when $pn \to 1$).

MSC: 05C83 Graph minors 05C80 Random graphs (graph-theoretic aspects)

Keywords: Hadwiger number; random regular graphs; graph minors

Full Text: DOI

References:
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