

# On the upper tail of subgraph counts in sparse $G(n, p)$

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## Abstract

Given a fixed graph  $H$ , what is the (exponentially small) probability that the number  $X_H$  of copies of  $H$  in the binomial random graph  $G(n, p)$  is at least twice its mean? In 2011 DeMarco and Kahn determined the order of  $-\log \mathbb{P}(X_H > 2\mathbb{E}X_H)$  for general  $p = p(n)$  when  $H$  is a clique and conjectured what it should be for general  $H$ . In this note we show that (close to the threshold of existence) their conjecture is false for an infinite family of graphs  $H$ . This is joint work with Lutz Warnke.