PHASE TRANSITION ON THE DEGREE SEQUENCE OF A RANDOM GRAPH PROCESS WITH VERTEX COPYING AND DELETION

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Abstract: This paper focuses on the degree sequence of a random graph process with copying and vertex deletion. A phase transition is revealed as the following: when copying strictly dominates deletion, the model possesses a power law degree sequence; and when deletion strictly dominates copying, it possesses an exponential one; otherwise, the model possesses an intermediate degree distribution which decay as $e^{-O(\sqrt{k})}$. Note that, due to copying, the edge number of the model may grow super-linearly and the model may exhibit a power law with any exponent greater than 1.