

Consider the random graph on n vertices $1, \dots, n$. Each vertex i is assigned a type X_i with X_1, \dots, X_n being independent identically distributed as a nonnegative discrete random variable X . We assume that $\mathbf{E}X^3 < \infty$. Given types of all vertices, an edge exists between vertices i and j independent of anything else and with probability $\min\{1, \frac{X_i X_j}{n} (1 + \frac{a}{n^{1/3}})\}$. We study the critical phase, which is known to take place when $\mathbf{E}X^2 = 1$. We prove that normalized by $n^{-2/3}$ the asymptotic joint distributions of component sizes of the graph equals the joint distribution of the excursions of a reflecting Brownian motion $B^a(s)$ with diffusion coefficient $\sqrt{\mathbf{E}X\mathbf{E}X^3}$ and drift $a - \frac{\mathbf{E}X^3}{\mathbf{E}X}s$. This shows that finiteness of $\mathbf{E}X^3$ is the necessary condition for the diffusion limit. In particular, we conclude that the size of the largest connected component is of order $n^{2/3}$.