LARGE DEVIATIONS OF THE INTERFERENCE IN A WIRELESS COMMUNICATION MODEL

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Interference from other users limits the capacity, and possibly the connectivity, of wireless networks. We consider a simple model of a wireless ad-hoc network where node locations are described by a homogeneous Poisson point process, and node transmission powers are random. For light-tailed transmission powers we obtain a large deviation principle for the total interference, and relate the speed of the large deviation principle to the tail decay rate of the distribution of transmission power. For heavy-tailed transmission powers we provide asymptotic upper and lower bound for the tail of the interference distribution.