Percolation in the Information Theoretically Secure Wireless Network Graph

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Percolation in an information-theoretically secure graph is considered where both the legitimate and the eavesdropper nodes are distributed as Poisson point processes. For the pathloss plus fading model, upper and lower bounds on the minimum density of the legitimate nodes are derived (as a function of the density of the eavesdropper nodes) for which the probability of formation of an unbounded connected cluster is non-zero. To allow concurrent transmissions from multiple legitimate nodes, a signal-to-interference plus noise ratio secure graph is introduced, and for which an upper bound on the minimum density of the legitimate nodes is derived such that the probability of having an unbounded connected cluster is non-zero.