

Lecture 2.  
**Analyzing D2D Mobility in 5G Network.**

Fifth generation (5G) cellular systems are expected to rely on the set of advanced networking techniques to further enhance the spatial frequency reuse. Device-to-device (D2D) communications is one of them allowing users to establish direct connections. The use of direct communications is primarily determined by the signal-to-interference ratio (SIR). However, depending on the users movement, the SIR of an connection is expected to drastically fluctuate. This lecture shows how the technique of nonstationary random trajectories generation could help solve this problem. We develop an analytical framework allowing to predict the channel quality between two moving entities in a field of moving interfering stations. Assuming users movement driven by Fokker-Planck equation we obtain the empirical probability density function of SIR. The proposed methodology can be used to solve problems in the area of stochastic control of D2D communications in cellular networks.