

WiOpt 2015- Invited Talk

Professor Naoto Miyoshi (Tokyo Institute of Technology)

Title

Downlink Coverage Probability in a Cellular Network with Ginibre Deployed Base Stations and Nakagami-m Fading Channels

Abstract

Recently, spatial stochastic models based on determinantal point processes (DPP) are studied as promising models for analysis of cellular wireless networks. Indeed, the DPPs can express the repulsive nature of the macro base station (BS) configuration observed in a real cellular network and have many desirable mathematical properties to analyze the network performance. However, almost all the prior works on the DPP based models assume the Rayleigh fading while the spatial models based on Poisson point processes have been developed to allow arbitrary distributions of fading/shadowing propagation effects. In order for the DPP based model to be more promising, it is essential to extend it to allow non-Rayleigh propagation effects. In the present paper, we propose the downlink cellular network model where the BSs are deployed according to the Ginibre point process, which is one of the main examples of the DPPs, over Nakagami-m fading. For the proposed model, we derive a numerically computable form of the coverage probability and reveal some properties of it numerically and theoretically.