

Measurement based Shadow Fading Model for Vehicle-to-Vehicle Network Simulations

Author(s) - Institution(s):

Taimoor Abbas, Lund
Fredrik Tufvesson, Lund
Johan Karedal, Lund

Corresponding author email: taimoor.abbas@eit.lth.se

Corresponding WG group: TWGV

Abstract:

The Vehicle-to-Vehicle (V2V) propagation channels have significant implications on the design and performance of novel communication protocols for Vehicular Ad Hoc Networks (VANET). Extensive research efforts have been made to develop and implement V2V channel models for advanced VANET system simulators. The impact of shadowing caused by other vehicles has, however, largely been neglected in most of the models, as well as in the system simulations. In this paper we present a simple shadow fading model targeting system simulations based on real world measurements performed in urban and highway scenarios. Video information from the measurements is used to separate the line-of-sight (LOS) condition from the obstructed LOS by vehicles and buildings. It is observed that the vehicles obstructing LOS induce an additional attenuation of about 10 dB in the received signal power. We use a Markov chain based state transition diagram to model transitions from LOS to obstructed LOS and present state transition intensities for a real traffic mobility model.