

## **Exploitation of LTE Channel Measurements at 450 MHz and Channel Modeling Implementation in a Suburban and Rural Deployment**

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It is well established that the 450MHz band is a promising candidate for the deployment of wireless services in sub-urban and rural areas, due to its propagation characteristics. Compared with higher bands, it requires a smaller number of base stations to give a broad reach, covering more than adequately large areas with a dispersed population. Due to the growing interest in the research of applications like Machine to Machine (M2M), smart grid and Wireless Local Loop (WLL) systems, recent channel measurement campaigns attempted to fill the gap that exists regarding the field trial experience at lower cellular frequencies. The coverage delivery of up to around 30 km for sparsely populated areas is well suited for suburban and rural environments, whereas the recent LTE450 standardization, the growing interest in technical issues for this band and the clear evidence of vendor interest in supporting LTE450 are some of the promising facts that prove the evolvement of the specific frequency band.

The use of channel models is an ideal choice to validate new concepts in mobile communications and design future wireless systems, as it enables the planning of the networks and cells for wireless communication deployments. The geometrically based stochastic channel models exploit the statistical parameters from measurement campaigns and provide equivalent channel coefficients. Thus, it is obvious that the measured propagation characteristics of an environment are essential.

In this work, the implementation of a simulated suburban and rural scenario deployment is investigated, taking advantage of the extracted from measurements statistical parameters, as the delay spread (DS), the shadow fading (SF), the (Ricean) K-factor (KF) and a parameterized Hata path loss model. A channel modeling characterization approach is utilized and its characteristics across a simulated suburban and rural scenario deployment are examined, with a view to highlight the prospects and the weaknesses of this emerging frequency band by means of channel modeling approach. Differences between existing simulation scenarios are emerged and explained. The results will be presented and discussed at the conference.