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Ultra Reliable Communication: Availability Analysis in 5G Cellular Networks

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Abstract : To meet the growing demand of users, the fifth generation (5G) will continue to provide services to higher data rates with higher carrier frequencies and wider bandwidths. As part of the 5G communication paradigm, Ultra Reliable Communication (URC) is envisaged as an important technology pillar for providing anywhere and anytime services to end users. Ultra Reliable Communication (URC) is considered an important technology that why it has become an active research topic. In this work, we analyze the availability of a service in the space domain. We characterize spatially available areas consisting of all locations that meet a performance requirement with confidence, and we define cell availability and system availability, individual user availability, and user-oriented system availability. Poisson point process (PPP) and Voronoi tessellation are adopted to model the spatial characteristics of a cell deployment in heterogeneous networks. Numerical results are presented, also highlighting the effect of different system parameters on the achievable link availability.

Keywords : URC, dependability and availability, space domain analysis, Poisson point process, Voronoi Tessellation
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