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Impact of Frequency-Hopping NB-IoT Positioning in 4G and Future 5G Networks

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The positioning support is under study within the narrowband (NB) Internet of things (IoT) standard of Long Term Evolution (LTE) cellular networks. However, the limited signal bandwidth of this technology poses serious difficulties to achieve a position accuracy below 50 meters, which may be required in current 4G and future 5G standards. This work studies the impact of a frequency-hopping (FH) scheme on the LTE positioning reference signal (PRS) for NB-IoT applications. The downlink time-difference of arrival (TDoA) method is used to compute the achievable positioning performance of FH PRS scheme. The simulation results indicate the feasibility to achieve a position accuracy below 50 meters, by covering a system bandwidth of 10 MHz with two consecutive hops. Future work is aimed to evaluate the FH impairments for advanced configuration schemes.

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