

Abstract

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An optimized LTE measurement handover procedure for high speed trains using WINNER II channel model

Wireless Communication network is essential for railway environments as it provides safety and reliability for railway operation as well as improved railway services. Currently, Global System for Mobile Communications Railways (GSM-R) is widely used in railway systems. It is believed that GSM-R system has availability and reliability thanks to its commercial success. At the same time, GSM-R has a lot of shortcomings in high speed transmission. As a result, the Long Term Evolution for Railway (LTE-R) is considered as the natural evolution for current (GSM-R) system. Trains travelling at very high speeds suffer from many handovers between cells. One of the essential targets of LTE is providing fast and seamless handover between cells. Hence, handover triggering decision is very important in the design of handover process. One of the major problems that cause radio link failure is the too late handover triggering. It occurs when the train is moving faster than the handover parameter settings. In this paper, we propose an optimized measurement handover procedure for High Speed Trains (HST) which can accelerate the measurement procedure when the train is moving toward a target cell with a higher speed than designed to compensate the train acceleration. As a result, too late handover probability will be reduced causing a subsequent reduction in radio link failure probability.