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Asymptotic error rates in third-generation wireless systems

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The introduction of the so-called third-generation wireless communication system, also known as UMTS or IMT-2000, is a large-scale revolution in telecommunications. It uses a technique called code division multiple access (CDMA). An advanced algorithm to improve the performance of such a CDMA system is called hard-decision parallel interference cancellation and was studied by van der Hofstad and Klok for a rather basic model. We extend many of their results to a more realistic model, where different users transmit at different powers and where additive noise is present.

Keywords: code division multiple access; exponential rate; hard-decision parallel interference cancellation; large-deviation theory