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Interference Reduction Employing Walsh-Hadamard Precoding in Downlink Heterogeneous Network - Submitted to WCNC 2012

Abstract - In Heterogenous Network (HetNet), indoor customers can gain bigger coverage with the implementation of femtocells. Unfortunately, this implementation will add interference to the macrocell users. In this paper, a precoding technique using Walsh-Hadamard spreading is introduced to the femtocell users in order to reduce the interference towards the downlink of the macrocell users. Results show that the BER performance and the obtainable throughput of the macrocell user improves as the spreading factor used in the femtocell user increases.

Assessment of Aggregate Interference from Ultra-Wideband Devices into Fixed-Satellite Service - Published in ConTEL 2011

Abstract— Ultra-wideband (UWB) is a short-range radiocommunication technology that involves the generation and transmission of signals which spread over a large frequency range. Since UWB signals occupy a wide bandwidth, they will overlap with the frequency bands that have been allocated to various radio-communication services. There are studies conducted by the International Telecommunication Union Radio-communication Sector (ITU-R) as well as other international organisations such as the European Conference of Postal and Telecommunications Administrations (CEPT) which indicated that there is a potential interference being caused by UWB devices into the fixed-satellite service (FSS) in the downlink (space-to-Earth) direction. This paper provides aggregate interference assessments from UWB devices into the FSS receiver. These analyses determine the effective isotropic radiated power (EIRP) density limits and the required separation distances for UWB devices to avoid interference to the FSS receiver. Results of the research are compared with the studies conducted by the ITU-R and CEPT. Finally, new EIRP density limits are proposed for the UWB devices, in order to adequately protect the FSS receiver in the satellite downlink bands of 3.4-4.2 GHz, 4.5-4.8 GHz and 7.25-7.75 GHz