Mário Marques da Silva, Américo Correia, João C. Silva, Nuno Souto "Joint MIMO and Parallel Interference Cancellation for the HSDPA" - ISSSTA 2004, Sydney, Australia, 31Aug-02Sept 2004;

Abstract: We propose a combination of a transmit and receive diversity scheme based on 2X2 Multiple-Input-Multiple-Output (MIMO) with a Multiple Access Interference (MAI) cancellation scheme which consists of the variation of the conventional Parallel Interference Cancellation (PIC), for high data rate transmissions over frequency selective Rayleigh fading channels, in the downlink direction, namely the High Speed Data Packet Access (HSDPA) of Third Generation Partnership Project (3GPP).

It is known that the Alamouti Space-Time Coding / MIMO schemes achieve better results for channel profiles closer to uniform power profile [1]. However, these kinds of channel profiles present higher level of Inter-Path Interference (IPI), which is responsible for the increase of higher level of MAI. On the other hand, it is known that the PIC has a better performance in situations where several users present the same received power [2]. For these reasons the PIC perfectly fits with the 2X2 MIMO scheme. Hence, we consider the use of a specific type of Clipped Soft Decision (CSD) – PIC, optimized for MIMO operation.

It is shown that the use of the MIMO combined with the proposed PIC scheme can achieve a high performance improvement over the correspondent schemes, and hence, the HSDPA is able to increase the data rate, also with a performance improvement in the Bit Error Rate (BER).