LOW COMPLEXITY ITERATIVE RECEIVERS FOR SPACE−TIME BLOCK CODED MC−CDMA DOWNLINK SYSTEMS (ThuAmOR10)

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Abstract :

Multi−carrier code division multiple access (MC−CDMA) and space−time block coding (STBC) are two promising techniques to fulfill the high−speed and spectral efficiency requirements of fourth generation mobile communication systems. In this contribution we present an iterative receiver for the downlink of STBC MC−CDMA systems, that aims to mitigate the effects of multiple access interference (MAI) by jointly optimizing multiuser detection and channel decoding. Our proposal is a two−stage parallel interference canceller (PIC), where soft information in the form of log−likelihood ratios (LLRs) is exchanged between the multiuser detector (MUD) and individual channel decoders for successive refinement. In the first iteration a minimum mean square error (MMSE) equalizer, adapted to the equivalent channel as seen after space−time combining, is used for multiuser detection, whereas for the second and successive iterations a bank of MMSE filters adapted to each user and optimized for the quasi MAI free case is employed.

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