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Research Letter

Chip-Level HARQ Chase Combining for HSUPA

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Abstract

Hybrid automatic repeat request (HARQ) is used in high-speed uplink packet access (HSUPA) to increase the data rate. Chase combining is the simplest of HARQ algorithms. It provides a time diversity and requires a small memory. In this paper, we propose a technique to increase the chase combining efficiency. In this method, HARQ transmissions are seen as additional receive antennas which are jointly combined at chip-level using a space time linear minimum square error (LMMSE). We demonstrate that the chase combining diversity gain is considerably increased especially for high-order modulation.