Real-Time Alamouti STBC Decoding on a Programmable Baseband Processor

Johan Eilert, Di Wu and Dake Liu

Department of Electrical Engineering, Linköping University, 581 83 Linköping, Sweden

Abstract

This paper presents a space-time block coding decoder for MIMO-OFDM enabled mobile terminals. The decoder is implemented using a programmable baseband processor aimed for software-defined radio (SDR). The dynamic range supplied by the floating-point SIMD datapath allows special algorithms to significantly reduce the computational latency of decoding. The programmable solution not only supports different transmit/receive antenna configuration, but also allows hardware multiplexing to obtain silicon and power efficiency. Compared to several existing fixed-functional ASIC solutions in literature, the one proposed in this paper is by far the smallest, fastest and with more flexibility.