MULTILEVEL CODING USING TRELLIS-CODED MODULATION AND REED-SOLOMON CODES

Abstract

A multilevel coded modulation scheme trellis encodes (in 112) a portion of the input data, and the resulting encoded stream is used (in 120) to identify a particular one of a predetermined number of subsets of symbols of a predetermined signal constellation. The remaining input data is coded using a Reed-Solomon (RS) code (in 114) whose output is used to select for transmission a particular symbol from the identified subset. In applications in which phase hits or other channel phenomena may cause the received signal points to be phase-rotated versions of the signal points that were transmitted, differential encoding is included in the overall coded modulation scheme. In different embodiments, the differential encoding/decoding and RS encoding/decoding are in different orders. In one such embodiment, overlapped multilevel codes are used to preserve the advantages afforded by taking a multilevel coding approach.

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