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Ralf Koetter* (koetter@uiuc.edu), 1308 W. Main St., Champaign, IL 61801. *Nested Interpolation for Reduced Complexity Soft Decoding of Reed Solomon Codes*. Preliminary report.

We address an issue in the interpolation/factorization based decoding of Reed Solomon and algebraic geometric codes. One of the main steps in such decoding algorithms is to find a polynomial of minimal weighted degree that passes a given set of points with prescribed multiplicity. Efficient algorithms for this task are available but they do not admit nested solutions where the set of points is organized in several incremental batches. We address this issue and generalize the algorithms to allow for a solution of this problem. In this way a small collection of tentative codewords can be obtained from which the best codeword can be easily chosen. The procedure further improves on the efficiency and engineering trade-off of soft decoding of Reed Solomon codes. (Received August 30, 2005)