1074-94-20 **Nathan Axvig*** (axvignd10@vmi.edu), 431 Mallory Hall, Virginia Military Institute, Lexington, VA 24450. *Can pseudocodewords be used to increase communication rates?* Preliminary report.

The linear programming decoder of Feldman, Karger, and Wainwright operates by solving a linear programming relaxation of the maximum likelihood decoding problem. As such, one may assume that the output of the linear programming decoder is a vertex of the underlying polytope - such vertices are known as linear programming pseudocodewords. Although the set of codewords always lies within the set of pseudocodewords, it is often the case that the polytope contains non-integer vertices that do not correspond to codewords. When such a nontrivial pseudocodeword is output by the linear programming decoder, an error is declared and the decoder fails. In this talk, we explore how one might incorporate such nontrivial pseudocodewords into the encoding scheme so that meaningful information might be extracted from a received vector even when the output is a nontrivial pseudocodeword. (Received June 26, 2011)