Combining Low Rate Codes with Multilevel Signaling

Daniel J. Costello, Jr.
Dept. of Electrical Engineering
University of Notre Dame
Notre Dame, IN 46556
(costello.2@nd.edu)

Abstract

In this talk we discuss the application of multilevel signaling techniques to the design of codes with spectral efficiencies between 0.50 and 1 bit/dimension. Conventionally, at spectral efficiencies below 1 bit/dimension, high rate codes with binary (BPSK or QPSK) signaling techniques are employed. However, at rates near 1 bit/dimension, significant coding gains can be achieved by combining low rate codes with multilevel signaling. We consider low rate turbo codes along with 8-PSK and 16-QAM signal sets in a bit-interleaved coded modulation format to achieve spectral efficiencies below 1 bit/dimension. We investigate the gains achievable with this approach compared to conventional binary signaling techniques.

References