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Research Letter

Energy Detection of Multilevel PAM Signals with Systematic Threshold Mismatch

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Abstract

We address a symbol decision problem with spectrally efficient energy detected multilevel pulse amplitude modulated (PAM) signals. First, we analytically quantify the relationship between a systematic threshold mismatch and the required increase of the average signal-to-noise ratio to preserve a desired symbol error rate. For the case in which such an increase is not tolerable, we present a novel near-optimal multilevel threshold selection scheme, which is accurate for a wide range of system parameters.