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## A combined turbo code with adaptive predistortion scheme for a non-linear channel

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ABSTRACT. In this paper a distortion compensator suitable for improving the Digital Video Broadcasting Satellite (DVB-S) standard is presented for nonlinear amplification using a Travelling Wave Tube Amplifier (TWTA). The combined predistortion with Turbo Codes (PDTC) scheme is based on a feedforward neural network within an extended Kalman filter algorithm to estimate the coefficients and a conventional turbo code. The proposed scheme mitigates the degradation due to nonlinear amplification and additive white Gaussian noise by an adaptive predistorter and a turbo code, respectively. The results obtained by the PDTC scheme are compared with the theory curve using 16-QAM modulation. Computer simulation confirms that for the case of 16-QAM signals amplified with TWTA a performance improvement of  $E_b/N_o$  equal to 4 dB at a BER of  $10^{-4}$  is obtained when compared with the theory curve.

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