Generalised Linear Amplification with Nonlinear Components for Broadband Wireless Systems

Design of OQPSK-type signals with quasi-constant envelope and good spectral characteristics.—Design of MM schemes to be combined with LINC-type techniques.—Design of linear amplification schemes for general constellations that employ multiple NL amplifiers.—FDE design of MM and OQPSK-type schemes.—Definition of matching requirements for multi-amplifier techniques.

GENERAL MOTIVATION AND OBJECTIVES

This project addressed the design, implementation and validation of digital transmission techniques with high power and spectral efficiency for future wireless broadband systems, with focus on transmission techniques compatible with highly efficient grossly NL (Non-Linear) power amplifiers. For that purpose, new signal designs and/or transmission techniques compatible with grossly NL amplifiers were developed.

CHALLENGE

Design and implementation of digital transmission techniques with high power and spectral efficiency to be employed in the uplink of mobile systems or in satellite communications. Design signals with low PAPR (Peak-to-Average Power Ratio) or even quasi-constant envelope and high spectral efficiency and employ amplification techniques based on low-cost, highly efficient NL (NonLinear) amplifiers (e.g. class D and E amplifiers), which are simpler and have higher amplification and output power than quasi-linear amplifiers.

PROJECT WEBPAGE URL
http://tle1.dee.fct.unl.pt/galnc

Fig. 1 Transmitter structure

Fig. 2 Receiver structure with detail of the decision block in the uncoded (A) and coded (B) cases

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