

## **Semi-Random LDPC Codes for CDMA Communication over Nonlinear Bandlimited Satellite Channels**

Landolsi, M.A. (2006) *Semi-Random LDPC Codes for CDMA Communication over Nonlinear Bandlimited Satellite Channels*. International journal of satellite communications and networking, 24 (4). pp. 303-317.

### **Abstract**

This paper considers the application of low-density parity check (LDPC) error correcting codes to code division multiple access (CDMA) systems over satellite links. The adapted LDPC codes are selected from a special class of semi-random (SR) constructions characterized by low encoder complexity, and their performance is optimized by removing short cycles from the code bipartite graphs. Relative performance comparisons with turbo product codes (TPC) for rate 1/2 and short-to-moderate block sizes show some advantage for SR-LDPC, both in terms of bit error rate and complexity requirements. CDMA systems using these SR-LDPC codes and operating over non-linear, band-limited satellite links are analysed and their performance is investigated for a number of signal models and codes parameters. The numerical results show that SR-LDPC codes can offer good capacity improvements in terms of supportable number of users at a given bit error performance.