Impairment mitigation in superchannels with digital backpropagation and MLSD - DTU Orbit (22/12/2018)

Impairment mitigation in superchannels with digital backpropagation and MLSD

We assess numerically the performance of single-carrier digital backpropagation (SC-DBP) and maximum-likelihood sequence detection (MLSD) for DP-QPSK and DP-16QAM superchannel transmission over dispersion uncompensated links for three different cases of spectral shaping: optical pre-filtering of RZ and NRZ spectra, and digital Nyquist filtering. We investigate the limits for carrier proximity of each spectral shaping technique and the correspondent performance behavior of each algorithm, for both modulation formats. For superchannels with carrier spacing close to the Nyquist limit, it is shown that the maximum performance improvement of 1.0 dB in Q-factor is provided by those algorithms. However, such gain can be highly reduced when the order of the modulation format increases.

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