ONS Problem Set 3

Wednesday, November 16, 2016

Problem 1: Summary – Dispersion and Noise

a) Calculate the dispersion-limited reach of an M-level pulse amplitude modulation (M-PAM). Therefore, extend the formula derived in Problem 1 of problem set 2.

b) Compare OOK and 4PAM in terms of their noise resilience and the dispersion-limited reach, respectively. Compare them in terms of symbol rate and data rate. Assume a noise equivalent power of $10\,pW/\sqrt{Hz}$ at the receiver.

Problem 2: Cyclic redundancy check (CRC)

a) A CRC allows to detect transmission errors in i.e. an Ethernet transmission system. With a given generator polynom of '110101', calculate the transmitted frame for an input data sequence '11011'.

b) Check whether the received bit sequences '1101100101' and '1001100101' have been received correctly using the same generator polynom.

For questions and suggestions on the ONS tutorial please contact:

Stefan Wolf, Bldg. 30.10, Room 1.23,
E-Mail: s.wolf@kit.edu

Denis Ganin, Bldg. 30.10, Room 2.23/1,
E-Mail: denis.ganin@kit.edu