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1.2 Objectives and scope of the thesis

This work is focused on the development and implementation of novel and effective methods for simulation of pulse propagation in nonlinear photonic structures, mainly in the CRR structures. The CRR with the Kerr nonlinearity is under investigation.

The first objective is to develop a suitable physical model based on the coupled mode theory that will describe propagation of optical pulses in Kerr nonlinear waveguide structures.

The second objective is to investigate possible numerical schemes for solving of the resulting equations. The emphasis will be made on the stability and efficiency of the developed schemes.