Abstract

This thesis reports on the construction of an Erbium-fiber frequency comb. The laser system consist of a mode-locked Erbium-fiber laser and an Erbium-fiber amplifier. The laser system emits ultrashort light pulses with a duration of 45 fs, a repetition rate of 100 MHz and an average power of 250 mW. By coupling those pulses into a highly nonlinear fiber, we try to broaden the spectrum to reach a width of more than an octave. Additionally, we report on a setup with which we are able to characterize ultrashort laser pulses.

Furthermore, we present results of the numerical simulation of the nonlinear Schrödinger equation, which describes the spectral broadening inside the highly nonlinear fiber.