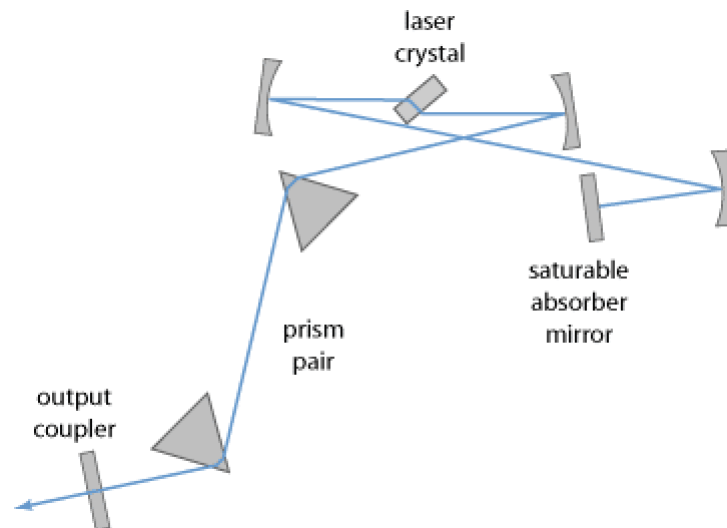


Pulse Propagation in Mode-Locked Lasers

UCCS Department of Mathematics
Fall 2007 Colloquium Series



Presented by:
Theodoros P. Horikis

November 8, 2007

University Center
Room 116A
12:15 p.m.

(Refreshments at 12:00 p.m.)

Mode-locked lasers generate ultra-short optical pulses, with durations ranging from hundreds of picoseconds down to a few femtoseconds. Applications utilizing such lasers range from communications and high harmonic generation to optical clock technology and even measuring of the fundamental constants of nature. Mode-locked lasers are essentially optical oscillators requiring the two basic constituents of any laser, namely amplification and loss. In this talk we will discuss a new system that efficiently models these two effects and together with the appropriate filtering term supports the mode-locking mechanism for both constant dispersion and dispersion managed solitons. In so doing, we will present a numerical technique, called spectral renormalization, which allows us to study the soliton solutions of these systems.