

Dynamics of optical frequency combs modeled by the Lugiato-Lefever equation

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The Lugiato-Lefever equation is a nonlinear Schrödinger-type equation with damping, detuning and driving, derived in nonlinear optics by Lugiato and Lefever (1987). While extensively studied in the physics literature, there are relatively few rigorous mathematical studies of this equation. Of particular interest for the physical problem is the dynamical behavior of periodic and localized steady waves (frequency combs). The underlying mathematical questions concern the existence and the stability of these types of waves. In this talk, I'll show how different tools from bifurcation theory, spectral theory, and nonlinear analysis can be used to investigate some of these questions. The focus will be on periodic waves and their stability.

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