



Seminar of the Work Group
Nonlinear Partial Differential Equations
Institute for Analysis
WS 24/25

Speaker: Lukas Bengel
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Seminar room: SR 3.061

Soliton-based frequency combs in the Lugiato-Lefever equation

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Abstract

Kerr frequency combs are optical signals consisting of a multitude of equally spaced excited modes in frequency space. They are generated by converting a continuous-wave pump laser within an optical microresonator. In its simplest form, the physics in the microresonator is modeled by the Lugiato-Lefever equation, a damped nonlinear Schrödinger equation with forcing. In this talk we demonstrate that the Lugiato-Lefever equation supports arbitrarily broad Kerr frequency combs by proving the existence and stability of periodic solutions consisting of any number of well-separated, strongly localized and highly nonlinear pulses.

The talk is based on a joint work with Björn de Rijk (KIT).