



Seminar of the Work Group
Nonlinear Partial Differential Equations
WS 21/22

Speaker: Elias Gasmi
January 18th, 2022, 14:00 - 15:30
Zoom Link: <https://kit-lecture.zoom.us/j/5732649920>
Meeting ID: 573 264 9920

Frequency combs in a ring resonator with two pumped modes

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Abstract

From an experimental point of view it is quite attractive to study the generation of Kerr frequency combs by pumping multiple modes. As an example, such techniques allow to excite bright square pulses in normal dispersion resonators with small waveguide cross-sections, which could feature significantly improved power conversion efficiency. We discuss a new variant of the Lugiato-Lefever equation which corresponds to the situation where two modes are pumped. In the first part of the talk we will show how a-priori bounds and degree theory can be used to obtain existence results. We conclude the first part with some numerical plots which fit our analytical results. In the second part we will demonstrate a heuristic for finding localized solitons in the case of two pumped modes via numerical path continuation. Finally, we will define and analyze some performance metrics for localized solitons.