



Seminar der Sächsischen Forschergruppe FOR 877

Donnerstag, den 30.04.2015, um 15:30 Uhr

Ort: Reichenhainer Str. 70; Physikgebäude, Raum: 2/P033



Dr. Jaime Cisternas

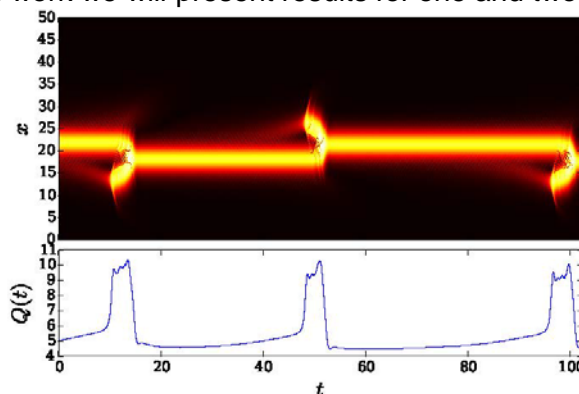
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"Explosive dissipative solitons and their anomalous diffusion"

Dissipative solitons show a variety of behaviors not exhibited by their conservative counterparts. For instance a dissipative soliton can remain localized for a long period of time without major profile changes, then grow and become broader for a short time —suffer an explosion—, returning to the original spatial profile afterward. In this presentation we consider the dynamics of dissipative solitons and the onset of explosions in detail, inspired by a model of mode-locked lasers based in the complex Ginzburg-Landau equation.

We show how the appearance of explosions has the general signatures of intermittency: the periods of time between explosions are irregular even in the absence of noise, but their mean value is related to the distance to criticality by a power law. We conjecture that these explosions are a manifestation of attractor-merging crises, as the continuum of localized solitons induced by translation symmetry become connected by short-lived trajectories, forming a delocalized attractor.

Now the spatial jumps induced by the explosions are random so in the long run the trajectory of the soliton will follow a diffusive behavior that can show the scaling signatures of anomalous diffusion: 'walk and stick'. This effect would indicate a capacity of the soliton to 'remember' the directions of its past jumps, and adding another complexity layer to the already known behavior. In this work we will present results for one and two spatial dimensions.



Interessenten sind herzlich eingeladen.