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Sturm Meanders: Global Attractors, Temperley-Lieb Algebras, and Black Holes

Fusco and Rocha studied Neumann boundary value problems for scalar ODEs of second order via a shooting approach. They introduced the notion of what we now call Sturm permutations. These permutations relate, on the one hand, to a special class of meandering curves as introduced by Arnol'd in a singularity theory context. On the other hand, they became central in the study of global attractors of nonlinear parabolic partial differential equations of Sturm type.

We discuss relations of Sturm meanders with further areas: the multiplicative and trace structure in Temperley-Lieb algebras, discrete versions of Cartesian billiards, and the problem of constructing initial conditions for black hole dynamics which satisfy the Einstein constraints. We also risk a brief glimpse at the long and meandric history of meander patterns themselves.

We report on joint work with Pablo Castañeda, Juliette Hell, Carlos Rocha, and Brian Smith. For further material we recommend the beautifully illustrated book “Meanders” by Anna Karnauhova, de Gruyter 2017. See also <http://dynamics.mi.fu-berlin.de/>

Приглашаются все желающие!