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Peakon inspired spectral and inverse spectral problems

Peakon equations form a class of non-linear PDEs with weak (distributional) solutions akin to solitons but non-smooth. They can be studied using isospectral (spectrum preserving) deformations of boundary value problems, which generally are non-selfadjoint. Yet, these boundary value problems are multifold covers of spectral problems involving oscillatory kernels of the Gantmacher-Krein type. The inverse spectral problems for those lead to mixed Hermite-Padé approximations. In this talk, I will illustrate some of these ideas with two examples of peakon-bearing equations: the Novikov equation and a two-component Novikov equation. This talk is in part based on joint work with X. Chang.