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Rogue waves of infinite order

Rogue waves of infinite order are a family of special solutions to the focusing cubic nonlinear Schrödinger and modified Korteweg–de Vries equations on the line. They are not explicit, but each spatial profile is smooth and belongs to the space L^2. Remarkably, these solutions do not resolve into a superposition of solitons and radiation, as can be seen from their slow $t^{-1/3}$ temporal decay. Indeed, as these profiles are not in L^1, they lie outside the scope of known soliton resolution results, and are not amenable to classical inverse-scattering methods.

In this talk, we will discuss a new approach to the scattering theory for these infinite-order rogue waves. This is based on joint work with Deniz Bilman and Peter D. Miller.