

Energy cascades for multi-soliton solutions of the Calogero–Moser derivative NLS equation

Patrick Gérard

I will introduce the Calogero–Moser derivative NLS equation

$$i\partial_t u + \partial_{xx} u + (D_x + |D_x|)(|u|^2)u = 0$$

posed on the subspace $H_+^2(\mathbb{R})$ of the Sobolev space $H^2(\mathbb{R})$ made of functions with Fourier transforms supported in the positive half line. Using a Lax pair structure, I will describe a class of globally defined and smooth solutions which exhibit energy cascades as t tends to infinity in the following strong sense : the norm $\|u(t)\|_{H^s}$ behaves like $|t|^{2s}$ for every $s > 0$. This is a joint work with Enno Lenzmann (Basel).