Fractional Schrödinger equation with Landau Damping on a half -line.

Liliana Esquivel

We consider the initial-boundary value problem for the modified Schrödinger equation, posed on positive half-line $x > 0$:

$$\begin{cases} u_t + iu_{xx} + |u|^2 u + |\partial_x|^{\frac{1}{2}} u = 0, \ t \geq 0, \ x \geq 0; \\ u(x,0) = u_0(x), \ \ x > 0 \\ \alpha u(0,t) + \beta u_x(0,t) = h(t), \ t > 0. \end{cases}$$

where $\alpha \in \{0,1\}$, Re $\beta \geq 0$ and $|\partial_x|^{\frac{1}{2}}$ is the module-fractional derivative operator defined by the modified Riesz Potential

$$|\partial_x|^{\frac{1}{2}} u = \frac{1}{\sqrt{2\pi}} \int_0^{\infty} \frac{sign\,(x-y)}{\sqrt{|x-y|}} u(y) dy.$$

We prove the global-in-time existence of solutions for a nonlinear fractional Schrödinger equation with inhomogeneous Neumann boundary conditions. We are also interested in the study of the asymptotic behaviour of the solutions.