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Existence of extremizers for a Strichartz estimate for the 4^{th} order Schrödinger equation

Abstract: In dispersive PDE, Strichartz estimates are a fundamental tool in understanding the evolution of waves. The search for extremizers in the corresponding inequalities is an active area of research, and is intimately related with the study of the Fourier extension operator from certain hypersurfaces.

In this talk, we discuss the sharp Strichartz estimate

$$\| |\partial_x|^{\frac{1}{3}} e^{it\partial_x^4} f\|_{L^6_{t,x}(\mathbb{R}^{1+1})} \leq C \|f\|_{L^2(\mathbb{R})} \tag{1}$$

for the fourth order Schrödinger equation in one spatial dimension

$$i\partial_t u + \partial_x^4 u = 0. \tag{2}$$

A careful analysis of the convolution measure on the quartic shows that extremizers for this inequality do exist, resolving the dichotomy in [2].
This is based on a joint work with Diogo Oliveira e Silva and René Quilodrán.

References

[1] Gianmarco Brocchi, Diogo Oliveira e Silva, and René Quilodrán, *Sharp Strichartz inequalities for fractional and higher order Schrödinger equations*, arxiv:1804.11291.

[2] Jin-Cheng Jiang, Benoit Pausader, and Shuanglin Shao, *The linear profile decomposition for the fourth order Schrödinger equation*, Elsevier, Journal of Differential Equations, 2010.