

LOCAL SMOOTHING INEQUALITIES AND RADIAL FOURIER MULTIPLIERS

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Abstract

The so called local smoothing problem for the wave equation (as formulated by Sogge) is the question whether the inequality

$$\left(\int_0^1 \|e^{it\sqrt{-\Delta}} f\|_{L^q(\mathbb{R}^d)}^q dt \right)^{1/q} \lesssim \|f\|_{L_\beta^q(\mathbb{R}^d)}$$

holds for $\beta = (d-1)(1/2 - 1/q) - 1/q$, for suitable $q \gg 2$. Here L_β^q is the usual Sobolev space.

We shall report progress on this and related questions, obtained in work with Gustavo Garrigos and Wilhelm Schlag, and in work with Fedya Nazarov.

The paper with F. Nazarov also gives, for fixed $p \neq 2$, a characterization of all radial multipliers of $\mathcal{FL}^p(\mathbb{R}^d)$ provided that the dimension d is large enough.