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Title:

Do radial multipliers have continuous symbols?

Abstract

There is a rich interplay between classical (Euclidean) harmonic analysis and its non-commutative aspects. Often, the classical knowledge, well established, serves as a motivation for non-commutative extensions. I will discuss an example in the other direction, where a famous open question from operator algebras (Connes' rigidity conjecture about the von Neumann algebras of $\mathrm{SL}_n(\mathbf{Z})$) and some partial structural results obtained with Lafforgue and de Laat motivate a new question in Euclidean harmonic analysis: if a radial function on $\mathbf{R}^d$ ($d \geq 2$) defines a bounded Fourier multipliers on L_p ($p \neq 2$), must it be continuous? I will present partial results and connections with the Kakeya conjecture.