

**Date:** Thursday November 28, 2024

**Time:** 15:30 CET

**Room:** UB iA (Universitat de Barcelona)

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## A phase-space approach to weighted Fourier extension inequalities

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The goal of the talk is to present a certain ray bundle representation of the Fourier extension operator in terms of the Wigner transform to investigate two longstanding conjectures in the restriction theory of the Fourier transform, namely Stein's and the Mizohata-Takeuchi conjecture. In joint work with Bennett, Gutierrez and Nakamura, we show how Sobolev estimates for the Wigner transform can be converted into certain tomographic bounds for the Fourier extension operator to the paraboloid, which imply weaker variants of these conjectures. We are also able to extend this analysis to a wide class of hypersurfaces, a step that requires finding and understanding a good "geometric" replacement for the classical Wigner transform. Our results do not depend on lower bounds for the Gaussian curvature of these manifolds, which contrasts the intuition behind the classical Fourier restriction conjecture. If time allows, we will make a connection between our results and Flandrin's conjecture in signal processing.