Mean-dispersion principles and the Wigner transform

David Jornet

Universitat Politècnica de València

Given a function $f \in L^2(\mathbb{R})$, we consider means and variances associated to f and its Fourier transform $\hat{f}$, and explore their relations with the Wigner transform $W(f)$, obtaining, as particular cases, a simple new proof of Shapiro's mean-dispersion principle, as well as a stronger result due to Jaming and Powell. Uncertainty principles for orthonormal sequences in $L^2(\mathbb{R})$ involving linear partial differential operators with polynomial coefficients and the Wigner distribution, or different Cohen class representations, are obtained, and an extension to the case of Riesz bases is studied.

This is a joint work with Chiara Boiti (Università degli Studi di Ferrara) and Alessandro Oliaro (Università di Torino)