The Hardy Uncertainty Principle and Schrödinger evolutions

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Abstract. In Mathematics, there are different properties that relate the behavior of a function to the behavior of its Fourier transform. In this talk, we will focus on Uncertainty Principles, which state that a function and its Fourier transform cannot decay simultaneously too fast at infinity. Among the different known uncertainty principles, the one which will be of interest was given by Hardy in 1933, with a proof based on complex analysis arguments. However, in the last years, Escauriaza, Kenig, Ponce and Vega developed a proof of this principle, in terms of solutions to Schrödinger equations, by using real analysis arguments.

The aim of the talk is to review this theory and adapt it to a discrete setting, assuming that our space variable is not in $\mathbb{R}^n$, but it is a point of the lattice $\mathbb{Z}^n$.

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