

Thursday, 30 June, 12:00 – 13:00

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ICMAT

Nodal sets of monochromatic waves from a deterministic and random point of view

In this talk we present recent results on the nodal set (i.e., the zero level set) of monochromatic waves (i.e., solutions of the Helmholtz equation) on the Euclidean space. Following the breakthrough work of F. Nazarov and M. Sodin, a growing literature gives us powerful probabilistic results for the number of connected components of the nodal set of random monochromatic waves. The aim of this talk is to explore the properties of these standard random monochromatic waves and, consequently, define a more general class of random monochromatic waves depending on a real parameter, which includes the standard definition as a particular case. This parameter controls some regularity (of the Fourier transform) and decay properties of these waves. Given that, we study the structure of the nodal set depending on that parameter from a deterministic and from a random point of view. Finally, we show how to construct deterministic realizations or examples of monochromatic waves satisfying the probabilistic Nazarov-Sodin volumetric growth for the number of connected components of the nodal set and similarly for the volume of the nodal set. This is a joint work with A. Enciso, D. Peralta-Salas and A. Sartori.

Link to the seminar:

<https://us06web.zoom.us/j/99649860282?pwd=SE0vemtYMFwIwBFBNTXQyOTBONG0vZz09>