Peijel's nodal domain theorem in spaces with synthetic Ricci curvature lower bounds

Sara Farinelli

Lagrange Mathematics and Computation Research Center

November 13, 2023

In the last decades the study of geometric and analytical properties of metric measure spaces satisfying synthetic Ricci curvature lower bounds has received a huge attention. However not much is known about the classical topics of nodal sets and nodal domains of eigenfunctions of the Laplace operator in this setting. In this seminar we will show how the Peijel's nodal domain theorem can be proved in this possibly singular setting where the main difficulty relies on the possibly non locally Riemannian structure of the space. The techniques used to face the problem in the case of Dirichlet and Neumann Laplacian on domains, apply in the particular case of domains of the Euclidean space, allowing us to extend existing results on the validity of the Pleijel's nodal domain theorem to a bigger class of sets.

Based on a joint work with Nicoló de Ponti and Ivan Yuri Violo