Journée rouennaise d'analyse géométrique, June 20th, 2023

Fida El Chami, Nicolas Ginoux, Georges Habib, Ola Makhoul, Simon Raulot

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1   Hiba Bibi, Université de Tours

Title: Unique continuation property for biharmonic hypersurfaces in spheres

Abstract: We prove a unique continuation theorem for non-minimal biharmonic hypersurfaces of spheres, based on Aronszajn's 1957 article. Under the right hypotheses, this result shows that, for these immersions, CMC on an open subset implies globally CMC. We then deduce new rigidity theorems to support the Conjecture that biharmonic submanifolds of Euclidean spheres must be of constant mean curvature.

2   Nicolas Ginoux, Université de Lorraine

Title: Eigenvalue estimates for the biharmonic Steklov operator on forms

Abstract: The biharmonic Steklov problem is a scalar fourth-order boundary eigenvalue problem which was first introduced by Kuttler and Sigillito in the sixties. We first formulate it for differential forms and show various bounds for its smallest eigenvalues, some of which involve lower-order operators such as the Dirichlet or Neumann Laplacian. This is joint work with Fida El Chami, Georges Habib and Ola Makhoul.

3   Georges Habib, Université Libanaise

Title: Magnetic Hodge Laplacian on differential forms

Abstract: We introduce the magnetic Hodge Laplacian which is a generalization of the magnetic Laplacian on functions. We consider various spectral results, which are known for the magnetic Laplacian on functions or for the Hodge Laplacian on differential forms and discuss similarities and differences of this new magnetic-type operator. This is a joint work with Michela Egidi, Katie Gittins and Norbert Peyerimhoff.

4   Emmanuel Humbert, Université de Tours

Title: Observability and quantum limits

Abstract: I will explain a series of works with E. Trélat and Y. Privat. The starting point was a paper whose goal was to give an explicit computation of the observability constant for the wave equation in long time which lead us to the study of eigenfunctions of the Laplacian for large eigenvalues.

5   Julien Roth, Université Gustave Eiffel

Title: Some geometric applications of eigenvalue pinching for hypersurfaces

Abstract: We will give a general pinching result for the L^2-norm of the position vector of hypersurfaces of Euclidean spaces. From this general result, we will derive some pinching results associated with optimal eigenvalue estimates for the first positive eigenvalue of different operators, including in particular the Laplacian. Finally, we will give some geometric applications for almost umbilical, almost Weingarten or almost stable hypersurfaces.