ID de Contribution: **30**   Type: **Non spécifié**

Boundary estimation for the Stokes system

vendredi 4 juillet 2025 09:45 (45 minutes)

Neglecting the inertial term in the Navier–Stokes system leads to the Stokes system. We are interested in observing this system from an interior region of a domain. We consider general boundary conditions that include, for instance, the commonly used Dirichlet, Navier, and Neumann conditions. Observation is achieved through a local Carleman estimate near a boundary point, derived from the full system, including the pressure term. We begin by reviewing how boundary estimates can be obtained for first-order scalar operators. Then, we show how various scalar reductions of the Stokes system can lead to such first-order equations, by means of eigenvectors and generalized eigenvectors.

This is joint work with Luc Robbiano.

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