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Zineb is a Research Scientist at New York University Abu Dhabi. She earned her PhD from Université de Rennes in 2015. Prior to her current role, she served as a Courant Instructor at the Courant Institute of Mathematical Sciences at New York University from 2015 to 2018, subsequently joining NYUAD in 2018 as a research scientist. Zineb's research primarily delves into Nonlinear Analysis and Partial Differential Equations within the realm of fluid dynamics.

Title: On the desingularization of time-periodic vortex motion in bounded domains

Abstract:

In this talk, we will discuss vortex motions for Euler equations in planar domains. In this setting, the dynamics of a single vortex is governed by a Hamiltonian system, with most of its energy levels corresponding to time-periodic motion. We show that, under certain non-degeneracy conditions, it is possible to desingularize most of these trajectories into time-periodic concentrated vortex patches. The proof uses a Nash-Moser scheme and KAM techniques combined with complex geometry tools. Additionally, we will present a vortex duplication mechanism to generate synchronized time-periodic motion of multiple vortices. This is a joint work with Taoufik Hmidi and Emeric Roulley. setting, the dynamics of a single vortex is governed by a Hamiltonian system, with most of its energy levels corresponding to time-periodic motion. We show that, under certain