

# Stable and unstable steady states for the HMF model

Florian MEHATS

Institut de Mathématiques de Rennes, Université de Rennes 1

**Abstract :** The Hamiltonian Mean-Field (HMF) model is a 1D simplified version of the gravitational Vlasov-Poisson system. I will present two recent works in collaboration with Mohammed Lemou and Ana Maria Luz. In the first one, we proved the nonlinear stability of steady states for this model, using a technique of generalized Schwarz rearrangements. To be stable, the steady state has to satisfy a criterion. If this criterion is not satisfied, some instabilities can occur: this is the topic of the second work that I will present.