ID de Contribution: **2** Type: **Non spécifié**

Two Methods for Deriving Singular Mean-Field Limits

lundi 12 janvier 2026 11:30 (1 heure)

We are interested in the question of mean-field limits, or deriving effective evolution equations of PDE type for a system of N points in singular interaction, for instance of Coulomb or Riesz nature, evolving by first order dynamics.
We will discuss two methods: the modulated energy method, that works well for gradient flows or conservative flows of Coulomb/Riesz type energies, and a new method based on a multiscale mollification metric, which works well for up to Coulomb interaction singularity, without much structure assumed.

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