

गणित विभाग, आईआईटी मद्रास  
DEPARTMENT OF MATHEMATICS, IIT-MADRAS

Special Seminar / विशेष संगोष्ठी

- Date / तारीख : Tuesday, the 12<sup>th</sup> January, 2016
- Time / समय : 3.00 p.m
- Venue / स्थान : HSB 257 (Seminar Hall, 1<sup>st</sup> Floor, Department of Mathematics)
- Speaker / वक्ता : Dr. Harsha Hutridurga (Department of Pure Mathematics and Mathematical Statistics (DPMMS), The University of Cambridge, United Kingdom)
- Title / शीर्षक : "Hypocoercivity and geometric control conditions in kinetic theory."

**Abstract:**

In this talk, we address the problem of 'trend to equilibrium' for a degenerate hypoelliptic equation (e.g. Vlasov-Fokker-Planck equation) in kinetic theory. By degenerate, we mean that the evolution equation follows a 'non-dissipative' transport equation in certain sub-domain of the phase space.


Borrowing ideas from control theory (to be precise, Bardos-Lebeau-Rauch control condition), we impose a certain geometric condition on the hamiltonian flow and the sub-domain of degeneracy guaranteeing the exponential decay of the semi-group associated with the evolution equation towards a global Maxwellian equilibrium in a weighted Hilbert space.


We shall also consider an example where the geometric condition mentioned earlier is violated, but the semi-group decays exponentially fast (this is in contrast to the results on linear Boltzmann equation).

This talk shall develop all the essential mathematical prerequisites. The approach is strongly influenced by Cedric Villani's strategy of 'Hypocoercivity' from Kinetic theory.

This is a joint work with H. Dietert (Cambridge), F. Herau (Nantes) and C. Mouhot (Cambridge).

"All are invited"

  
Dr. T. V. Anoop  
(Seminar in charge)  
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