1164-49-123 **Jin Feng*** (jinfeng@ku.edu), Department of Mathematics, University of Kansas, Lawrence, KS 66045, **Toshio Mikami** (t.mikami@tsuda.ac.jp), Department of Mathematics, Tsuda University, Kodaira, Tokyo, 187-8577, Japan, and **Johannes Zimmer** (jz@ma.tum.de), Department of Mathematics, Technical University of Munich, Blotzmannstr 3., 85748 Garching, Germany.

Hydrodynamic limit large deviation from nonlinear heat equation given by stochastic Carleman particles, A Hamilton-Jacobi approach.

The deterministic Carleman equation can be considered as an one dimensional two speed fictitious gas model. Its associated (2 scale) hydrodynamic limit gives a nonlinear heat equation. The first rigorous derivation of such limit was given by Kurtz in 1973. In this talk, starting from a more refined stochastic model giving the Carleman equation as mean field, we derive a macroscopic fluctuation structure associated with the hydrodynamic limit.

The large deviation result is established through an abstract Hamilton-Jacobi method applied to this specific setting. The principle idea is to identify a two scale averaging structure in the context of Hamiltonian convergence in the space of probability measures. This is achieved through a change of coordinate to the density-flux description of the problem. We also extend a method in the weak KAM theory to the infinite particle context for explicitly identifying the effective Hamiltonian. In the end, we conclude by establishing a comparison principle for a set of Hamilton-Jacobi equation in the space of measures.

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