

Quantitative Fluid Approximation for Heavy Tailed Kinetic Equations

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In past works it has been demonstrated that using an appropriate rescaling, linear kinetic equations with one conserved quantity give rise to a scalar fractional diffusion equation if the equilibrium is heavy tailed. In this talk an extension of this is presented, where the linear kinetic equations under consideration, not only conserves mass, but also momentum and energy. In the limit, fractional diffusion equations are obtained for the energy and the mass, while the equation for the momentum is trivial. The methods of proof presented rely on spectral analysis combined with energy estimates. It is constructive and provides explicit convergence rates.