

Singularity formation in some kinetic models

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In this talk, I will describe several blow-up results and long time asymptotics for some families of kinetic equations for spatially homogeneous and isotropic solutions. The equations include the so-called Nordheim equation, also known as quantum Boltzmann equation, and the kinetic equation which describes weak turbulence for the nonlinear Schrödinger equation. These equations have some analogies with the classical Boltzmann equation, but the difference is that they contain cubic nonlinearities, instead of quadratic. Due to this, the solutions of the corresponding kinetic equations can have blow-up in finite time as well as some peculiar long time asymptotics which cannot take place in the Boltzmann case.

References

- [1] *M. Escobedo, J. J. L. Velázquez*: Finite time blow-up for the bosonic Nordheim equation, arXiv:1206.5410.
- [2] *M. Escobedo, J. J. L. Velázquez*: On the blow up of supercritical solutions of the Nordheim equation for bosons, arXiv:1210.1664.