Coupled Vlasov-Euler models of thick sprays for heavy dusts

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Vlasov-Euler systems can be used to describe a large variety of coupled flows made where a gaseous phase interacts with droplets. These flows are encountered for in diesel engines for example and sprays. Heavy droplets lead to thick-spray models, in the other case one refers to thin-spray models.

I will show that some features of the mathematical structure of thick-spray models are surprising similar to the one Vlasov-Poisson equations for charged particles. In particular the techniques used for linear Landau damping find an easy generalization for thick-spray models. These similarities can be used to validate numerical methods.

All results were obtained with V. Fournet (PhD) and C. Buet (CEA/LIHPC).

References

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