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Far-from-equilibrium attractors for massive kinetic theory in the relaxation time approximation

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We investigate whether early and late time attractors for non-conformal kinetic theories exist by computing the time-evolution of a large set of moments of the one-particle distribution function. For this purpose we make use of a previously obtained exact solution of the 0+1D boost-invariant massive Boltzmann equation in relaxation time approximation. We extend prior attractor studies of non-conformal systems by using a realistic mass- and temperature-dependent relaxation time and explicitly computing the effect of varying both the initial momentum-space anisotropy and initialization time on the time evolution of a large set of integral moments. Our findings are consistent with prior studies, which found that there is an attractor for the scaled longitudinal pressure, but not for the shear and bulk viscous corrections separately. We further present evidence that both late- and early-time attractors exist for all moments of the one-particle distribution function that contain greater than one power of the longitudinal momentum squared.

Category

Theory

Collaboration (if applicable)

Primary authors: ALALAWI, Huda; STRICKLAND, Michael (Kent State University)

Presenter: ALALAWI, Huda

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