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On the Cauchy problem for the relativistic Vlasov-Poisson-Fokker-Planck system. (English)

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Summary: We consider the Cauchy problem for the relativistic Vlasov-Poisson-Fokker-Planck system in the whole space. For perturbative initial data with suitable regularity, we obtain the global classical solutions and prove the exponential time decay rate to the equilibrium around a global relativistic Maxwellian.

MSC:

[35Q83](#) Vlasov equations

[35Q84](#) Fokker-Planck equations

[82C31](#) Stochastic methods (Fokker-Planck, Langevin, etc.) applied to problems in time-dependent statistical mechanics

[35A01](#) Existence problems for PDEs: global existence, local existence, non-existence

[76Y05](#) Quantum hydrodynamics and relativistic hydrodynamics

[82D10](#) Statistical mechanics of plasmas

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exponential time decay rate; relativistic Vlasov-Poisson-Fokker-Planck system

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