On global existence for the Einstein-Vlasov system with symmetry

Håkan Andreasson
Department of Mathematics
Göteborg University
S-412 96 Göteborg
SWEDEN

Abstract

In the asymptotically flat case the only symmetries one can impose are spherical and axial symmetry. In the spherically symmetric case global existence is known for small initial data. There is no analogous result for other phenomenological matter models. In the cosmological case one can impose many symmetry assumptions. The most general global existence result for the Einstein-Vlasov system in the cosmological case is for T^2 symmetric spacetimes (a very general class of spacetimes which admit two Killing fields) for arbitrary initial data. These results strongly indicate that Vlasov matter is a well-behaved matter model in general relativity. I will give an overview of global existence results for this system. I will also discuss the present status of the spherically symmetric problem in the asymptotically flat situation for large initial data. An affirmative solution of this problem would imply weak cosmic censorship.