

1139-83-124

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For reasonable equations of state, non-rotating stellar models are necessarily spherically symmetric, and are solutions to the Tolman–Oppenheimer–Volkoff equation. While global existence, uniqueness and even smoothness of these solutions is known since 1991, very little is still known about the geometry of these fluid solutions. In general, it is even difficult to determine whether the fluid is confined to a bounded region (with vacuum exterior) or extends to infinity. We will see that the asymptotic behavior largely depends on the prescribed equation of state and central density. In particular, solutions with linear and certain polytropic equations of state do not have finite extend and are not even asymptotically flat. We introduce new tools to describe their global geometry. This is joint work with Lars Andersson. (Received February 05, 2018)