Seventeenth Marcel Grossmann Meeting



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Bayesian analysis for rotational curves with l-boson stars as a dark matter component

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Using Low Brightness Surface Galaxies (LBSG) rotational curves we inferred the free parameters of l-boson stars as a dark matter component. The l-boson stars are numerical solutions to the non-relativistic limit of the Einstein-Klein-Gordon system, the Schrödinger-Poisson (SP) system. These solutions are parametrized by an angular momentum number l = (N-1)/2 and an excitation number n. We perform a bayesian analysis by modifying the SimpleMC code to perform the parameter inference, for the cases with l = 0, l = 1 and multistates of l-boson stars. We used the Akaike information criterion (AIC), Bayesian information criterion and the Bayes factor to compare the excited state (l=1) and the multi-state case with the ground state (l=0) as the base model due to its simplicity. We found that the data in most galaxies in the sample favors the multi-states case and that the scalar field mass tends to be slightly bigger than the ground state case.

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