UM Physics Department

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Title: A Fundamental Acceleration Scale in Galaxy Clusters

Abstract:

An acceleration scale $\sim10^{-10}\mathrm{m/s^2}$ is implicit in the baryonic Faber-Jackson (BFJ) and baryonic Tully-Fisher (BTF) relations, independently of theoretical preference or bias. We show that the existence of this scale in the BFJ relation is most apparent when data from pressure supported systems of vastly different scales including globular clusters, elliptical galaxies, and galaxy clusters are analyzed together. This suggests the relevance of the acceleration scale $10^{-10}\mathrm{m/s^2}$ to structure formation processes at many different length scales and could be pointing to a heretofore unknown property of dark matter.