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ABSTRACT ONLY (ORAL CONTRIBUTION)

PLANES OF SATELLITE GALAXIES: THEIR DYNAMICS AND POSSIBLE ORIGIN

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The anisotropic distribution of satellite galaxies in the Milky Way, Andromeda and Centaurus A cannot be readily explained by current galaxy formation models within the ΛCDM cosmology. The models predict preferential directions for accretion but many observational features, specially for the so-called vast thin plane of Andromeda satellites, are difficult to reproduce. In this work we approach the problem of finding an explanation to the formation of anisotropic satellite structures in two ways. First, we constrain the unknown proper motions of the satellite galaxies and use dynamical simulations to explore the possible orbits of satellites around Andromeda and reinterpret the observations. We find that 7 out of the 15 satellites in the Andromeda plane could have very similar orbits suggesting that the satellites came from a common accretion event. Second, we explore the validity of using dark matter only simulations to infer the properties of luminous satellites. To this end we use the results of the Illustris cosmological simulation to explore to what extent the spatial distribution of luminous satellites follows the distribution of dark matter sub-halos. We find that the distribution of luminous satellites is flatter than that of dark matter sub-halos. We also find a discrepancy between observations and simulations in how the orientation of the main halos is aligned with the axis that unites them.

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