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# Discs of satellites in the Illustris-TNG simulations I: identification of flattened systems

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The Local Group, dominated by the main galaxies: the Milky Way and the Andromeda galaxy, presents a scenario where a set of satellite galaxies orbiting around one of these two galaxies is observed. These satellites do not present an isotropic distribution, but rather the majority are located on a plane almost perpendicular to the plane of the galaxy's disk. In the case of the Milky Way, the distribution of dwarf galaxies presents a structure that has a radius ~ 200 kpc, where most of them is found, and a thickness of ~50 kpc, which has been called the disk of satellites or Vast Polar Structure of Satellite Galaxies (VPOS). For the Andromeda satellite disk, the radial extension is like that of the Milky Way, but with a slightly thinner width.
The study of the disks of dwarf satellites is important due to the discrepancy in the way in which dwarf galaxies are distributed around larger galaxies, since theoretically they should have a nearly isotropic distribution around their host galaxies, contrary to observations. Currently there is no theoretical model that correctly explains the spatial distribution of these objects within the Local Group or in other galactic systems.
This paper presents the results of a study on the identification of galaxy satellite disks in IllustrisTNG simulations at z = 0. From a total of 64066 systems made up of a central galaxy and several galaxies that orbit around it, we have detected 5393 flattened systems resembling the VPOS. The method used for detecting flattened distributions of galaxies and some statistics of the found systems are presented.

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