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Phase spirals in cosmological simulations of Milky Way sized galaxies.

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Abstract

The Gaia DR2 revealed the phase spirals in the Z - Vz plane, whose origin is still under study, but linked to the Sagittarius dwarf galaxy tidal interaction. In our work, we detect phase spirals in the vertical projection Z - Vz of the disc's stellar particles for the first time in the zoom-in cosmological simulation GARROTXA which includes hydrodynamics, and star formation. The detection and characterization of the phase spirals have been carried out with a Fourier decomposition-based technique. Our results indicate that these spiral-like structures in the phase space are present in a wide range of times and locations across the disk and that they become more evident in times close to the satellite pericenters. The phase spirals are better observed in the range of younger-intermediate star populations in cosmological simulations. We state that other mechanisms might appear naturally in our model, such as the physics of gas, the collective effect of multiple perturbers, and a dynamically cold population continuously renovated by the star formation that helps satellites to trigger the observed disk response.

My poster is available at https://zenodo.org/record/7022523#.Y7QECKfML0o