



Contribution ID: 47 Contribution code: P24

Type: Poster

Evolution of Disk-like Structures in the Galactic Centre

Monday, 19 August 2024 17:18 (2 minutes)

In this work, we present an understanding of the complex mechanisms that govern the evolution of orbits in the Galactic Centre. Through N-body simulations, we have gained crucial insights into the evolution of disk-like structures in the Galactic Centre. We see that post-Newtonian corrections and perturbative effects are critical in stabilizing these structures. In their absence, these structures would disintegrate due to vector resonance relaxation. Additionally, our research has demonstrated how these disk-like structures can split and create multiple disks with different properties, which could explain both clockwise and counterclockwise disks, as well as the highly debated disk-like structures in the S-star cluster. Our findings shed light on the intricate interplay between gravitational forces from different bodies that shape the dynamics of stars, dusty sources, and compact stellar remnants in the Galactic Centre, providing an important theoretical contribution to the field.

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Session Classification: Flash Poster Presentations (in-person)