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ABSTRACT ORAL CONTRIBUTION

CONSTRAINING THE TANGENTIAL VELOCITIES OF ANDROMEDAS SATELLITE GALAXIES USING NONLINEAR OPTIMIZATION

D. E. Bernal-Neira[1], V. Arias-Callejas [1] and J. E. Forero-Romero[1]

Recent observations proposed the presence of a vast thin plane of corrotating dwarf galaxies orbiting the Andromeda Galaxy. Dynamical simulations of the behavior of this system using observational constrains have been made in order to propose the temporal evolution for this structure. In these simulations the tangential velocity of the satellite galaxies had to be guessed due to unavailable observational data. We propose using large scale Non Linear Programming (NLP) optimization algorithms to constrain the values for these tangential velocities. This numerical optimization is implemented by minimizing the difference between different initial conditions and trajectories of the dwarf galaxies and the simulated state of the system, subject to its current observed state. This proves the self-consistency of different initial conditions and trajectories to shed light on the possible formation processes and stability of this structure of satellites.

[1] Universidad de los Andes, Cra 1 N 18A- 12 Bogotá, (Colombia), (de.bernal531@uniandesedu.co).