

Constraints for dark matter local density and substructure properties from dynamic System-DM substructure interactions

Tuesday, 5 June 2012 15:50 (0:20)

Abstract content

The current paradigm of structure formation predicts the existence of sub-galactic structures which existence has not been confirmed nor excluded by astrophysical observations. Some of these substructures could be disrupted by tidal interactions with other galaxy components, leading to streams like structures. Whether subhalos or streams, the presence of these dark matter structures in the solar neighbourhood, if dense and abundant enough, could affect the dynamics of planetary orbits or even the earth-moon orbit. We use the distant tide approximation to calculate the energy injection from multiple encounters between dark substructures and planets and based on the high precision measurements of the planetary orbits, we set constraints to the density and fraction of substructures that can be present in the solar neighbourhood. The same procedure is applied for the case of open binaries in the Milky Way satellites, from which similar constraints are obtained. These limits could have important implications to the identification of dark matter.

Primary author(s) : Ms. GONZALEZ, Alma (Instituto de Ciencias Nucleares)

Co-author(s) : Dr. VALENZUELA, Octavio (Instituto de Astronomía, UNAM); Dr. AGUILAR, Luis (Instituto de Astronomía, UNAM.)

Presenter(s) : Ms. GONZALEZ, Alma (Instituto de Ciencias Nucleares)

Session Classification : Cosmology

Track Classification : Cosmology