RevMexAA (Serie de Conferencias), **49**, 113–113 (2017)

XV Latin American Regional IAU Meeting (Cartagena de Indias, Colombia, 3-7 October 2016)
Editors: Mario Armando Higuera Garzón & Santiago Vargas Domínguez

SIMULATIONS OF THE BIFURCATION OF THE TIDAL STREAMS OF THE SAGITTARIUS DWARF GALAXY

Y. D. Camargo[1,2] and R. A. Casas-Miranda[1]

We have performed several Newtonian N-Body simulations of the interaction between the Milky Way and the Sagittarius dwarf galaxy to investigate the formation of the observed bifurcations in the tidal streams of Sagittarius. Both galaxies are simulated as systems of particles.

The Sagittarius dwarf galaxy was discovered in 1994 by Ibata et al. 1995 and is located near the galactic plane. It has been under gravitational tidal forces that have produced tidal streams, showing bifurcations Fellhaufer et al. It is believed that Sagittarius dwarf galaxy is a dSph, however Peñarrubia et al. 2010 consider the progenitor of this galaxy as a disc galaxy to try to reproduce the bifurcations located in the north tidal stream.

The progenitor of Sagittarius is modeled as a stellar disc within a NFW dark matter halo, with a virial mass $M_v = 1 \times 10^8 M_\odot$ and 6.0×10^5 particles. The Milky Way is simulated as stellar disc within a NFW dark matter halo and stellar bulge, with a virial mass $M_v = 95.21 \times 10^1 0 M_\odot$ and 3.0×10^5 particles. The initial structures were constructed using GALIC and the time evolution was simulated with GADGET-2 for seven different angles (θ) between the angular momenta of the orbit and of the stellar disc. The initial orbit of each satellite has a pericenter of 11.35 kpc and apocenter of 67.85 kpc while the initial radial and tangential velocity components were 171 km/s and -295 km/s respectively.

We found bifurcations in the simulated tidal streams for $90° < \theta \leq 180°$ that are similar to the bifurcation reported in the literature. The simulated bifurcations appear at almost the same position of the observed ones but the remnants of the progenitors do not reproduce neither the position nor the physical properties of the actual Sagittarius. The simulated bifurcation more similar to the observed one corresponds to $\theta = 130°$ (see Figure 1), in contrast, Peñarrubia et al. 2010 found that the bifurcations are similar when $\theta = -20°$.

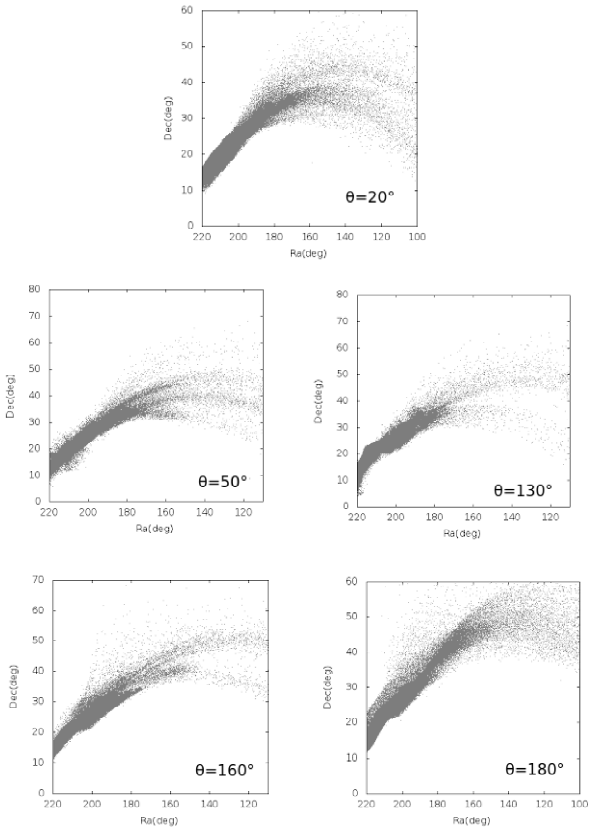

Fig. 1. Bifurcations obtained for 5 values of the angle θ.

[1]Universidad Nacional de Colombia (ydcamargoc@unal.edu.co).
[2]Universidad de Cundinamarca.