Contribution ID: **55** Type: **Contributed talk**

Gaia DR3 determination of the Galactic bar pattern speed

Wednesday, 6 September 2023 17:10 (15 minutes)

New 3D kinematic maps are derived based on Gaia DR3 proper motions and line-of-sight velocities for red giant branch stars, but now, unlike those published in Gaia Collaboration, Drimmel, Romero-Gómez+2022, taking into account the correlations between the proper motions, which contribute to the correlations between the derived kinematic variables. The large-scale correlations between the planar and vertical motions are studied, highlighting the impact of the bar and spiral perturbations on the stellar dynamics. Additionally, and taking advantage of the homogeneity of Gaia DR3 data, these maps are used to apply the recent version of the Tremaine-Weinberg method to compute the pattern speed of the Galactic bar (Bovy+2019, Leung+2021). The robustness and possible systematics of the method are tested using a set of test particle simulations of different bar pattern speeds and taking into account the expected observational errors. The value recovered using the Tremaine-Weinberg method is compatible with the one found in the Gaia Collaboration paper and previous works.

Primary authors: ROMERO-GOMEZ, Merce; CHEMIN, Laurent (Instituto de Astrofísica, Universidad Andres Bello, Chile); HUNT, Jason (Center for Computational Astrophysics, Flatiron Institute, New York, United States); DRIMMEL, Ron (INAF - Osservatorio Astrofisico di Torino, Torino, Italy); KHANNA, Shourya (INAF - Osservatorio Astrofisico di Torino, Torino, Italy); POGGIO, Eloisa (Université Côte d'Azur, Observatoire de la Côte d'Azur, CNRS, Laboratoire Lagrange, Nice, France); RAMOS, Pau (National Astronomical Observatory of Japan, Tokyo, Japan)

Presenter: ROMERO-GOMEZ, Merce

Session Classification: WG1: The Milky Way as a Galaxy (II). Chair: Antonella Vallenari