151. The disturbed outer Milky Way disc for stars with measured line-of-sight velocity.

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Abstract

The Milky Way's disc has been disturbed in the outer parts affecting the movements of stars. Using the position and proper motion measurements for 33 million stars in line-of-sight from Gaia DR3 we estimated a relationship between their vertical velocity and angular momentum around the galactic center. From the density distribution, the vertical velocity for stars in the disc at a galactic radius between ~10 to 14 kpc is strongly dependent on the angular momentum. However, a break or bimodality is visible in the vertical velocity distribution, particularly around ~ 11.5 kpc (~ 2700 kpc km/s). This bimodality has a downturn in vertical velocity at ~ 10 kpc (~ 2400 kpc km/s) to a minima at ~ 11.5 kpc (~ 2700 kpc km/s) followed by an abrupt break rising to a positive value. Main sequence stars are strongly affected by the disturbances in their vertical velocities. N-body simulations simulated that the passage of a Sagittarius-like dwarf galaxy can generate similar disturbances in the Galactic disc.

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