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Is dark matter present in our galaxy?

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Dark matter is a well-established component of our Universe. Dark matter is indispensable in cosmology, galaxies formation and is indirectly seen in galaxy clusters due to its gravitational lensing. A halo of dark matter can explain the flat rotation curve of galaxies. There are however doubts about the amount of dark matter in our own Galaxy. Some observations of our Galaxy do not need dark matter component to explain the kinematics. Moni Bidin *et al*. have analyzed kinematics of red giants in solar vicinity and found no evidence of dark matter. Mass density obtained by various gravitational microlensing observations explains the inner rotation curve without the need of any additional mass. The radial velocities of interstellar clouds are on the Keplerian rotation curve. We have analyzed old open clusters in the outer part of our Galaxy. At least some old open clusters are known to have nearly circular orbits. Circular orbits allow us to calculate the rotational velocity. The Galaxy rotational velocity derived from the radial velocities of old open clusters is consistent with the Keplerian velocity curve. Maybe we don't have dark matter in our Galaxy?

Biography

Piotr Gnaciński is an Astrophysicist working in the area of interstellar matter. He is an Associate Professor at the University of Gdańsk. He has 28 publications listed in Web of Science.

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