The effect of variation of stellar dispersion velocities by the galactic latitude in interpreting gravitational microlensing observations

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(Received 04 September 2018; in final form 20 December 2018)

Abstract

Our galaxy is a spiral galaxy and its stars are mostly in a thin disk and rotate around the galactic center. The vertical component of the dispersion velocity of stars is a function of the galactic latitude and decreases with increasing it. In the galactic Besancon model, this dependence is ignored and they just consider the dependence of dispersion velocity on the stellar age. Besancnon model is mostly applied to interpret the observational data of gravitational microlensing events to indicate the power index of the power-law number density of mass into the galactic disk. In this paper, we explain that ignoring the dependence of the dispersion velocity on the galactic latitude causes an overestimation of the number of low-mass objects in the galactic disk.

Keywords: gravitational microlensing, stellar dispersion velocity, gravitational microlensing observations

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