The Proper Motion of the Sagittarius Dwarf Spheroidal Galaxy

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Abstract

We propose to measure the proper motion for the Sagittarius dwarf spheroidal galaxy using archival WFPC2 images for three fields, each with three epochs covering a time baseline of four years. The relative proper motion of Sagittarius with respect to the mean motion of bulge stars will have an accuracy of 0.1 mas/yr. The absolute proper motion with respect to galaxies in the fields will have an accuracy of no worse than 0.9 mas/yr and most likely better -- approaching the 0.2 mas/yr accuracy of the best ground-based measurement. Our measurement will provide an independent check of the ground-based measurement and better determine the Galactic orbit of Sagittarius. The latter will help to determine, for example, the evolution of the orbit with time, the relation of the orbit to the star-formation history of Sagittarius, and the shape of the Galactic dark-matter halo.

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