DESC workshop on cosmology with peculiar velocities, Marseille, 22-26/09/2025



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Measuring Peculiar Velocities of Spiral Galaxies in DESI with the Tully-Fisher Relation

The Peculiar Velocity (PV) Survey of the Dark Energy Spectroscopic Instrument (DESI) is a secondary targeting program designed to carry out systematic measurements of peculiar motion at z < 0.2. The DESI PV Survey combines the spectroscopic galaxy redshifts recorded by DESI with standardizable distance measurements from Type Ia supernovae and elliptical and spiral galaxies in the DESI Bright Galaxy Survey. During the initial five-year DESI main survey, the DESI PV Survey will produce the largest catalog of peculiar velocities ever assembled, offering a unique perspective on the mass and motions in the low-redshift Universe. We describe the target selection and design of the Tully-Fisher sample in the PV Survey, discuss how we measure the rotational velocities of more than 50,000 spiral galaxies in the 2020 Siena Galaxy Atlas, and explain how we calibrate the Tully-Fisher Relation to measure the peculiar motion of these galaxies.

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