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Determining the Local Dark Matter Density

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An accurate determination of the local dark matter (DM) density is crucial to interpreting data from direct detection and certain indirect detection experiments, as it is degenerate with the DM-nucleon interaction strength. Here I give an update to our ongoing project to make a determination of the local DM density. Our method uses the positions and velocities of a set of tracer stars extending upwards out of the Milky Way disc, to which we fit a baryon and dark matter mass model using Bayesian nested sampling. The framework we have set up holds the promise of allowing us to minimise the number of assumptions needed, and thus determine the local DM density accurately and with a full quantification of its uncertainty. We have begun to apply our method to data from SDSS, and also plan to apply it to Gaia data.

Summary

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