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Estimating ages, distances, masses and extinction for field stars

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Detailed studies of the Milky Way's stellar populations usually rely on indirect measurements of stellar distances, ages, masses and extinctions. Thanks to the availability of large stellar surveys, these parameters can be determined with unprecedented precision even for field stars. Using a Bayesian approach that can combine spectroscopic, photometric and astrometric data, we determine distances, masses, ages and extinctions for over about 800,000 stars contained in the RAVE, APOGEE, Gaia-ESO and GALAH surveys. Our code (called StarHorse; Santiago et al. 2016; Queiroz et al., in prep.) has been validated for simulated high-resolution spectroscopic samples and reference samples, yielding a median precision of 8% in distance, 20% in age, 6% in mass, and 0.18 mag in A(V) in the case of highest-quality data. We also present results from the first application of our code to the the combined APOGEE+Gaia dataset.

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