



Distance determination for RAVE stars using stellar models III: The nature of the RAVE survey and Milky Way chemistry

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We apply the method of Burnett & Binney (2010) for the determination of stellar distances and parameters to the internal catalogue of the Radial Velocity Experiment (Steinmetz et al. 2006). Subsamples of stars that either have Hipparcos parallaxes or belong to well-studied clusters, inspire confidence in the formal errors. Distances to dwarfs cooler than ~ 6000 K appear to be unbiased, but those to hotter dwarfs tend to be too small by $\sim 10\%$ of the formal errors. Distances to giants tend to be too large by about the same amount. The median distance error in the whole sample of 216,000 stars is 28% and the error distribution is similar for both giants and dwarfs. Roughly half the stars in the RAVE survey are giants. The giant fraction is largest at low latitudes and in directions towards the Galactic Centre. Near the plane the metallicity distribution is remarkably narrow and centred on $[M/H] - 0.04$ dex; with increasing $|z|$ it broadens out and its median moves to $[M/H] \sim -0.5$. Mean age as a function of distance from the Galactic centre and distance $|z|$ from the Galactic plane shows the anticipated increase in mean age with $|z|$.

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