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Determining ages of asteroseismic targets: going beyond the use of scaling relations

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Asteroseismology allows us to measure the basic stellar properties of field giants observed far across the Galaxy. Most of such determinations are, up to now, based on simple scaling relations, involving the average large frequency separation (Dnu) and the frequency of maximum power (numax). In our work, we implement Dnu and the period spacing computed along detailed grids of stellar evolutionary tracks, into isochrones and hence in a Bayesian method of parameter estimation. Tests with synthetic data reveal that masses and ages can be determined with typical precision of 5 and 19 per cent, respectively, down to 3 and 10 per cent when we add independent information on the stellar luminosity. We also test this method to NGC6819 giants, found that the mean age, in agreement with other derivations, does not presents systematic differences between RGB and RC stars, but its dispersion is larger than expected, with the spread partially ascribable to stars that underwent mass-transfer events.

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