Constraining the transport processes in stellar interiors with red-giant stars in the open cluster NGC6819

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Abstract

Clusters are excellent test benches for verification and improvement of stellar evolution theory. Recent detection of solar–like oscillations in G–K giants in the open cluster NGC6819 with Kepler (Stello et al 2011, Corsaro et al. 2012) provides independent constraints on the masses and radii of stars on the red giant branch (RGB), as well as on the distance to clusters and their ages.

In the advanced evolutionary phases, whether on the red giant branch or on the He-burning phase, the chemical composition and the stellar structure of low- and intermediate-mass stars undergo significant changes. Different mechanisms have been proposed in literature to occur in these stars. Rotation is one these key processes that change all outputs of stellar models with significant impact on asteroseismic observables.

We present, for NGC6819, evolutionary models by considering different transport processes in stellar interiors, such as thermohaline mixing and rotation-induced mixing ; and the theoretical low-l frequencies of our stellar models. We discuss the effects of these processes on the asteroseismic and chemical properties, as well as on stellar structure (e.g. internal rotational profile), all along the red giant branch and during the clump.

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