Constraining dark matter with asteroseismology

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Abstract

High-precision asteroseismic data provides an excellent opportunity to test theories of stellar evolution and new physics, such as the properties of the dark matter (DM) of the Universe. Here I will show that some models of DM lead to changes in the classical scenario of stellar evolution. The accumulation of DM in the core of low-mass stars reduces their central temperatures, inhibiting the formation of small convective cores in 1.1-1.3 Ms stars. I will present the first asteroseismic constraints to the characteristics of the DM particles, obtained comparing the oscillations of Alpha Cen B with modified stellar models. To conclude, I will discuss the prospects to use CoRoT and Kepler data on main-sequence stars and red giants to further constrain the nature of dark matter.

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