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Modified gravity in the interior of population II stars (R)

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We study the effects of a beyond-Horndeski theory of modified gravity in the interior of a population II star. We consider a simple phenomenological model of a 1.1M star that has left the main sequence, has a thin Hydrogen burning shell with a partially degenerate isothermal core, surrounded by a radiative envelope having two regions of distinct opacities. Using suitable matching conditions at the two internal boundaries, a numerical analysis of the resulting stellar equations in modified gravity is carried out. While overall, gravity may be weakened, resulting in a decrease of the luminosity and an increase of the radius of the star, some of these effects are reversed near the core. It is suggested how the model, within its limitations, can yield a bound on the modified gravity parameter.

Session

Stellar nucleosynthesis

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