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Dark Matter in Stars: Capture uncertainties and RGB stars

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Dark Matter (DM) particles from the galactic halo can get gravitationally trapped inside stars. Once these particles settle in the interior of the star, DM-DM and DM-nucleon interactions can have an impact on the standard stellar evolution and the observations associated with it. These effects can in turn be used to probe the nature of galactic DM.

In this work I will discuss the underlying uncertainties associated with the process of Dark Matter capture, not only in the case of the Sun, but also for other types of stars located in different regions of the galaxy which are also relevant from an experimental point of view. We accomplish this by using a robust and consistent description of the DM halo phase space obtained by *Eddington Inversion* of the underlying galactic mass profile.

I will also discuss the preliminary results obtained for the effects of DM energy transport inside stars in the Red Giant Branch (RGB), and the implication these can have in current and future observations.

Primary author: Mr LOPES, José (CENTRA, IST, UL)

Co-author: Prof. LOPES, Ilídio (CENTRA, IST, UL)

Presenter: Mr LOPES, José (CENTRA, IST, UL)

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