

Halo-independent tests relevant for inelastic dark matter scattering

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One of the most important signatures of dark matter in direct detection is the annual modulation of the signal, due to the motion of the Earth around the Sun. In inelastic scattering, the minimum velocity a WIMP must have to deposit a recoil energy at the threshold of the detector is already close to the galactic escape velocity. In this case the experiment probes the tails of the dark matter halo velocity distribution where halo substructures are expected. I will present halo-independent methods to analyze the results of direct dark matter detection experiments assuming inelastic scattering. I will specifically discuss the consistency of the inelastic scattering interpretation of the DAMA annual modulation signal, focusing on the tension with the bound from XENON100.

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