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Analyzing Fermionic Dark Matter Scenarios with the HESS J1731-347 Compact Object

In this presentation I will show how we can constrain Dark Matter (DM) scenarios with the supernova remnant HESS J1731-347. We assume the compact object to be an admixture of DM and Neutron Star, and presume the former to behave as a free Fermi gas. For the Neutron Star we use recently calculated regulator-independent equations of state for neutron stars obtained from first principles. Using the two-fluid formalism we analyze the impact of the DM contribution to the mass and radius of the compact object in terms of the DM particle mass and the DM fraction. This allows us to constrain different scenarios for fermonic DM behaving as a free Fermi gas.

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