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Neutron Star Heating and the Muon g-2 Discrepancy

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The observed value of the muon magnetic dipole moment can be explained in models with weakly-interacting massive particles (WIMPs) coupled to muons. However, a considerable range of parameter space of such models will remain unexplored in future LHC experiments and dark matter (DM) direct searches. Here I will discuss the temperature observation of neutron stars (NSs) as a promising way to probe such models given that WIMPs are efficiently captured by NSs through DM-muon or spin-dependent DM-nucleon scattering. We consider two classes of representative models, where the DM couples or does not couple to the Higgs field at tree level, and show that the maximal DM heating is realized in both scenarios.

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