

Solar Atmospheric Neutrinos and the Sensitivity Floor for Solar Dark Matter Annihilation Searches

Monday, 8 May 2017 16:48 (18 minutes)

In this talk I will discuss the production of high-energy neutrinos from interactions of cosmic rays with the solar atmosphere. Production of solar atmospheric neutrinos has been previously considered in the literature both as a potential source of high-energy neutrinos and as an irreducible background for dark matter searches. In our new calculation we estimate the uncertainties that arise from the solar atmosphere and hadronic interaction models. We further improve on previous calculations by considering neutrino oscillations in the propagation of neutrinos through the Sun. We predict that current event selections should observe ~ 1 event per year in detectors such as IceCube or the proposed mediterranean neutrino observatory, KM3Net. Finally, for the first time, we put this rate in the context of indirect dark matter searches from the Sun by calculating the high-energy solar neutrino floor, which is analogous to the low-energy solar neutrino floor in dark matter direct detection experiments.

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