



Contribution ID: 288

Type: Poster

Indirect detection of dark matter at INO

Neutrino fluxes arising from WIMP annihilation in the center of the sun(\odot), earth(\oplus) and galaxy can leave detectable signatures at the proposed 50-kt Iron Calorimeter (ICAL) detector at the upcoming India-Based Neutrino Observatory (INO). Although the atmospheric neutrinos will pose a serious background to such signal neutrinos, exploiting the excellent angular resolution of the ICAL detector we can suppress it considerably. The expected 90 % C.L. exclusion sensitivity limits for 500 kt-years exposure for $\tau^+\tau^-$ channel (100 % branching ratio) for WIMP-nucleon Spin Dependent (σ_{SD}) and Spin Independent (σ_{SI}) cross-section are found to be $\sigma_{SD,\odot} < 6.87 \times 10^{-41} \text{ cm}^2$ and $\sigma_{SI,\odot} < 7.75 \times 10^{-43} \text{ cm}^2$ for the WIMP mass (m_χ) = 25 GeV, and $\sigma_{SI,\oplus} = 1.02 \times 10^{-44} \text{ cm}^2$ for $m_\chi = 52.14 \text{ GeV}$.

Mini-abstract

We present prospects of detection of dark matter annihilation signatures at INO

Experiment/Collaboration

INO

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Session Classification: Poster session 4