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Seongjin In (Sungkyunkwan University, Korea): Solar Atmospheric Neutrino Searches with IceCube Neutrino Telescope

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Searches for dark matter annihilations in the Sun have resulted in some of the strongest bounds on the dark matter proton scattering cross section. Solar dark matter searches, however face an irreducible background from solar atmospheric neutrinos. We are presenting a search for solar atmospheric neutrinos conducted with the IceCube neutrino telescope to quantify this sensitivity floor. IceCube is the worlds largest neutrino telescope and optimized to detect high energy neutrinos. It is ideally suited to search for solar atmospheric neutrinos and flux might be observable with IceCube.Solar atmospheric neutrinos, generated when cosmic rays interact with the atmosphere, are expected to have distinguishable shape of energy spectrum with atmospheric neutrinos generated in the Earth. The difference originates from the lower atmospheric density on the Sun, which allows secondary particles to decay rather than interact with the medium and lose energy. As a result, the amount of the solar atmospheric neutrino can be larger than it of the atmospheric neutrinos at the Earth above TeV energy. In this presentation, the sensitivity to the solar atmospheric neutrino flux and a potential application to solar dark matter searches will be presented.

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