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Probing Dark Matter-Neutrino Interactions via Supernova Neutrinos

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We consider the effect of interactions between supernova neutrinos and dark matter. As these neutrinos travel towards Earth through a column density of dark matter, they could interact via dark mediator, deflecting after the process. Depending on the location of the supernova with respect to Earth, the attenuation of the neutrino flux from a local supernova could be observable by neutrino detection experiments like DUNE, Hyper-K, and JUNO. For this talk, we choose a model of Dirac fermion dark matter and scalar mediator with various benchmark points, showing skymaps of the survival rate for a fixed neutrino energy and the expected event rate of observed neutrinos.

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