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Neutrino oscillations in the galactic dark matter halo

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The observation of PeV neutrinos has opened a window to study astrophysics and New Physics processes. Among PeV neutrino observables, the neutrino flavor composition become very interesting because it can reveal underlying interactions during the neutrino propagation. We consider the effect of galactic dark matter interactions on the neutrino oscillations. We estimate the effective interaction strength required to produce sizable deviations with respect to expected flavor composition from oscillations in vacuum. In addition, the spatial distribution of dark matter can lead to even larger deviations and can also produce a flavor composition that depends on the neutrino's arrival direction. These features might be observed in neutrino telescopes, like IceCube and KM3NET, depending on the telescope's sky coverage. Also, a positive signal has interesting insights for particle physics models.

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