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Dimuon production predictions for high energy neutrino detectors using the color dipole model

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Interactions of high-energy neutrinos with matter can be studied through the angular separation observed in dimuon production, an observable particularly sensitive to the transverse momentum dynamics of partons. In this work, we utilize the color dipole model, in conjunction with Pythia8 Monte Carlo shower and hadronization simulations, to predict dimuon production cross sections within the energy range relevant to IceCube and future detectors.

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