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Neutrino Fast Flavor Conversions in 1D Supernova Simulations SAMUEL FLYNN, SHERWOOD RICHERS, JAMES KNELLER, GAIL MCLAUGHLIN, North Carolina State University — Until recently the neutrinos emitted from the proto-neutron star created in a core-collapse supernova explosion were not expected to undergo flavor oscillations until significantly outside of the neutrinosphere. That expectation was later challenged when non-isotropic angular distributions of the neutrinos was considered. It was found, that under certain conditions, so-called 'fast flavor transformation' could occur at radii which were much closer to the core thus potentially altering the dynamics of the explosion. However, previous analysis of 1D supernova simulations did not find any instances when these conditions are prevalent. In this talk, I will first give an overview of fast flavor conversions by examining toy models which simplify the conditions for conversions to occur. I will then introduce linear stability analysis as a tool for examining more complex cases which more closely resemble supernovae, and our method of reconstructing the neutrino distribution function. Finally, I will present results indicating that fast oscillations can indeed occur in 1D supernova simulations, and suggest an explanation for why other analyses saw no such oscillations.

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