

A substandard candle: the low- ν method at few-GeV neutrino energies

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The low- ν method has been discussed as a “standard candle” in the context of accelerator neutrino beam experiments which require a precise understanding of the neutrino flux. The method utilizes a sub-sample of events where there is low energy-transfer to the nucleus, and requires that the interaction cross section is approximately constant for this sub-sample as a function of neutrino energy. However, it is unclear how reliable that assumption is due to the presence of nuclear and form-factor effects inherent in the interaction models.

This talk describes the low- ν method in detail and examines its prospects as a way to improve constraints on accelerator (anti)neutrino fluxes in an experiment-independent way. Ultimately, we will show that at the few-GeV energies of interest to current and future accelerator neutrino oscillation experiments, low- ν flux constraints are severely model-dependent, and are unlikely to offer any improvement on typical neutrino flux uncertainties, even with a perfect detector.

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