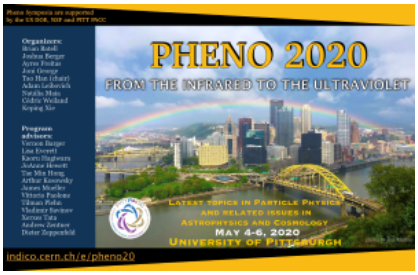


Contribution ID: **916** Type: **Parallel Talk**

# How well do we know neutrino-electron scattering? EFT approach for neutrino interactions

*Monday 4 May 2020 15:30 (15 minutes)*

Neutrino-electron scattering provides a clean tool constraining the neutrino flux at accelerator-based neutrino facilities and requires precise theoretical predictions. We determine the effective theory of neutrino-electron and neutrino-quark scattering and provide the most precise up-to-date prediction for neutrino-electron scattering cross sections quantifying errors for the first time to be of order $0.2 - 0.4$ %. Radiative corrections in the theory with electron and neutrinos can be determined from three effective couplings as an input. One is the Fermi constant which is known with sub-ppm accuracy. Another one has a small error of order $0.02$ %. The uncertainty of the third one is limited by the knowledge of hadronic contributions to charge-isospin vector-vector correlation function. We also discuss tests of the Standard Model exploiting inputs at different scales and provide the most precise neutrino-electron and neutrino-quark couplings. The latter can be useful for evaluating the Standard Model processes and constraining new physics scenarios.

## Summary

**Authors:** Dr TOMALAK, Oleksandr (University of Kentucky); HILL, Richard

**Presenter:** Dr TOMALAK, Oleksandr (University of Kentucky)

**Session Classification:** Neutrinos I

**Track Classification:** Neutrinos