Contribution ID: 42

Measurement of kaon-carbon forward scattering with EMPHATIC spectrometer

Saturday, 18 February 2023 17:00 (15 minutes)

The precision measurements of neutrino oscillation parameters and neutrino-nucleus scattering and also unprecedented sensitivity to physics beyond the Standard Model are the goals of the next generation of longbaseline neutrino experiments. To achieve this high precision and sensitivity, these experiments need a reduction of the uncertainties in neutrino flux calculations. New measurements of hadron-nucleus interaction cross sections are needed to reduce uncertainties of neutrino fluxes. EMPHATIC (Experiment to Measure the Production of Hadrons At a Testbeam In Chicagoland) is a low-cost, table-top-sized, hadron-production experiment located at the Fermilab Test Beam Facility (FTBF) that aims to measure hadron scattering and production cross sections that are relevant for neutrino flux predictions. In my presentation, I will show measurements of the differential cross-section as a function of scattering angle for kaon-carbon interactions with a single charged particle in the final state at beam momenta of 30 GeV/c. These results can be used in current and future long-baseline neutrino experiments, and demonstrate the feasibility of future measurements by the EMPHATIC spectrometer.

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Session Classification: February 18 Afternoon Session

Track Classification: Nuclear Physics