



PPD Seminar

Off-Axis and Model-Independent: Near-to-Far Neutrino Interaction Extrapolation with DUNE-PRISM

Abigail Peake (RHUL)

21 Oct 2026, 11:30

R61 CR03 (RAL)

The Deep Underground Neutrino Experiment (DUNE) will measure neutrino oscillation parameters with unprecedented statistical precision. At this level, systematic uncertainties from neutrino-nucleus interaction cross-sections become a limiting factor. Current interaction models are incomplete and often disagree with each other and with existing data, so relying on them risks biasing DUNE's oscillation measurements. A key challenge is relating the reconstructed neutrino energy measured in a detector to the true neutrino energy, since this mapping depends directly on interaction modelling. This talk presents a novel, model-independent method that learns this mapping directly from data. It uses DUNE's movable near detector, DUNE-PRISM, which samples the neutrino flux at different off-axis angles and therefore different energy spectra, to constrain the mapping across the full energy range relevant to oscillation physics.

