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Electrons for neutrino oscillation experiments

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The e4nu collaboration investigates lepton-nucleus interactions to deepen our understanding of neutrino behavior in nuclear environments. By leveraging the similarities between electron-nucleus and neutrino-nucleus interactions, e4nu utilizes a broad phase space of exclusive electron scattering data. This data, collected on nuclear targets similar to those used in neutrino oscillation experiments and within comparable energy ranges, is instrumental in improving the physics models used in event generators and refining methods for reconstructing the incoming neutrino energy.
After demonstrating a clear bias in the reconstructed lepton energy for the simple case study of quasi-elastic-like interaction, events with one lepton and one proton in the final state, this talk will present e4nu's latest results involving more complex final states with additional hadrons. These studies are particularly relevant for future DUNE measurements, which will involve a higher-energy neutrino beam.

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