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## Muon Neutrino –Nucleus Charge Current Interactions with Low Hadronic Activity Cross Section Measurements with NOvA

*Saturday 18 February 2023 12:30 (5 minutes)*

NOvA (NuMI Off-Axis  $\nu_e$  Appearance experiment) is an experiment located at the Fermi National Accelerator Laboratory studying neutrino oscillations, a quantum mechanical effect in which neutrinos change flavor as they travel. This poster presents a study of  $\nu_\mu$  CC (muon neutrino charged-current) interactions with a nucleus accompanied by low hadronic activity using data from the NOvA Near Detector. These interactions are marked by an enhancement of quasielastic and meson exchange current (MEC) events, and a suppression of resonance and deep inelastic scattering events. This analysis will allow for the study of nuclear effects in the  $\nu_\mu$  CC events via the enhancement of the MEC; these nuclear effects are one of the major sources of systematic uncertainty in the measurement of neutrino oscillation parameters. This analysis will extend previous work in two dimensions sensitive to nuclear effects from the muon perspective (cosine of the muon angle vs muon kinetic energy) to three dimensions (adding in available hadronic energy) to study nuclear effects from the hadronic perspective.

### Academic year

5th year and/or beyond

### Research Advisor

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**Session Classification:** Poster Session

**Track Classification:** High Energy Physics, Nuclear Theory and QFT