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Search for a large muon neutrino magnetic moment in the NOvA Near Detector

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Various scenarios of beyond the Standard Model physics predict Majorana neutrinos with large magnetic moments. NOvA is well suited for such searches since its detectors are optimized for efficient electron detection and its Near Detector (ND) is exposed to an intense neutrino flux from the NuMI neutrino beam at Fermilab. This facilitates the accumulation of significant statistics for studying muon-neutrino-electron elastic scattering in the ND. A deep learning neural network for particle identification training is used to distinguish scattered electrons from neutral pion induced electromagnetic showers and the charged current background. We present an overview of this technique and the sensitivity on the search for a muon neutrino magnetic moment.

Primary author: Mr WANG, Biao (Southern Methodist University)

Co-author: COAN, Thomas (Southern Methodist University)

Presenter: Mr WANG, Biao (Southern Methodist University)

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