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Search for fast magnetic monopoles with NOvA far detector.

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The NOvA experiment at Fermilab consists of two functionally identical liquid scintillator detectors called near detector and far detector to study neutrino oscillations using GeV-scale neutrinos from the Fermilab NuMI beam. Due to its location close to the earth's surface, surface area of over 4,000 \(m^{2}\), and little overburden, the NOvA far detector is sensitive to an extensive range of magnetic monopole masses and velocities. With the help of the far detector, we are looking for signals of relic monopoles in the cosmic rays flux that might have been produced in the early universe. We have developed the data-driven trigger(DDT), a robust trigger algorithm optimized for continuously searching the magnetic monopole-like patterns in the live data. Due to the surface proximity of the far detector, the major challenge for this analysis at the offline level is the rejection of cosmic ray background in the collected data. In this talk, I will present the status of the search for fast-moving magnetic monopoles using the data collected by the NOvA far detector.

Session

Astroparticle Physics and Cosmology

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