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The Mu2e Experiment

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The purpose of the Mu2e experiment is to search for the charged lepton flavor violating process muon to electron conversion in the field of a nucleus. A discovery from Mu2e would be a clear sign of physics beyond the standard model. Several cutting edge techniques will be employed in the experiment to improve the current experimental limits by four orders of magnitude. An intense beam of muons will improve the statistical sensitivity, while the pulsed nature of the beam allows for the mitigation of prompt backgrounds. A low-mass straw tube tracking detector immersed in a homogeneous magnetic field will precisely measure the momentum of outgoing electrons. Signal electrons are monoenergetic and can be distinguished from the intrinsic backgrounds which produce less energetic electrons. Further backgrounds originate from cosmic ray muons scattering in the detector material; they are rejected by an active shield around the detector. The experiment is under construction at this time. Recently, the collaboration conducted the most realistic simulation campaign to date to estimate the sensitivity of the experiment in Run 1 of the experiment, which will take place before the Fermilab LBNF/PIP-II shutdown. An overview of the Mu2e experiment is presented here, followed by an update of its current status.

Primary author: KAMPA, Cole (Northwestern University)

Presenter: KAMPA, Cole (Northwestern University)

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