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Automating MICE Controls and Monitoring

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The Muon Ionization Cooling Experiment (MICE) is a demonstration experiment to prove the feasibility of cooling a beam of muons for use in a Neutrino Factory and/or Muon Collider. The MICE cooling channel is a section of a modified Study II cooling channel which will provide a 10% reduction in beam emittance. In order to ensure a reliable measurement, MICE will measure the beam emittance before and after the cooling channel at the level of 1%, or an absolute measurement of 0.001. This renders MICE a precision experiment which requires strict controls and monitoring of all experimental parameters in order to control systematic errors. The MICE Controls and Monitoring system is based on EPICS and integrates with the DAQ, Data monitoring systems, and a configuration database. A new paradigm is being developed for MICE to ensure proper sequencing of equipment and use of system resources to protect data quality. A description of this system, its implementation, and performance during recent muon beam data collection will be discussed.

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