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Automated Template Testing and Management with GitLab Continuous Integration for AMS Offline Computing

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The Alpha Magnetic Spectrometer (AMS) is a particle physics experiment installed and operating aboard the International Space Station (ISS) from May 2011 and expected to last through 2030 and beyond. Data reconstruction and Monte-Carlo simulation are two major production activities in AMS offline computing, and templates are defined as a collection of data cards to describe different reconstruction and simulation tasks and to provide necessary input parameters. This paper presents how we use the Continuous Integration mechanism in GitLab to better manage the production datasets and templates, including syntax checking, functionality testing, performance testing, and the integration with existing production statistics monitoring system. The system also uses the pipeline schedules to periodically check the completing status of the production tasks and send warning messages to the administrators if the production progress is not as expected.

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