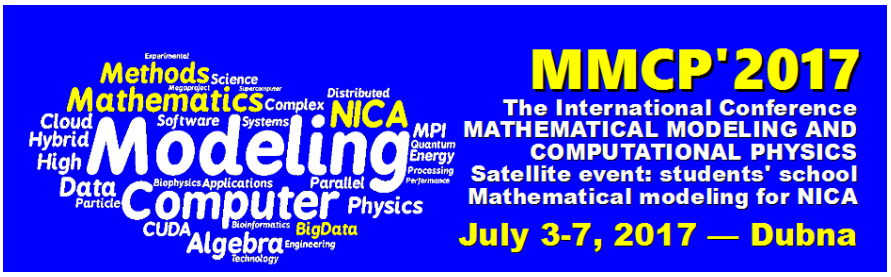

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A Scientific Workflow System for Satellite Data Processing with Real-time Monitoring

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Fully automatic processing of satellite data is a dream for every space weather scientist. In fact, a streamlined scientific workflow system that can process satellite data automatically and track the details of the data processing history is critical for the efficient handling of fundamental routines used in space weather research. The information that describes the details of data processing history is referred to as "provenance"which plays an important role in most of the existing workflow management systems and also space weather models that use data provided by such systems. The proper scope, representation, granularity, and implementation of a workflow management system can vary from domain to domain and pose a number of challenges for an efficient pipeline design. This paper provides a case study on satellite data processing, storage, and distribution in the space weather domain by introducing the SDDS system. The approach proposed in this paper was evaluated through real-world scenarios and addresses the provenance scope, representation, granularity, and implementation issues related to satellite data processing. Although SDDS is used as a primary data provider for space weather models at SINP MSU, the system can potentially be adapted to a wide range of data processing scenarios in other fields of physics.

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