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## Mock Data Challenge for the JUNO experiment

*Wednesday 26 October 2022 11:00 (30 minutes)*

The Jiangmen Underground Neutrino Observatory (JUNO) is under construction in South China at a depth of about 700 m underground: the data taking is expected to start in late 2023. JUNO has a very rich physics program which primarily aims to the determination of the neutrino mass ordering and to the precisely measurement of oscillation parameters.

The JUNO average raw data volume is expected to be about 2 PB/year and will be transferred from the experimental site to the main computing center (IHEP, Beijing, China) using a dedicated link. When raw data arrive to IHEP, a Data Quality Monitoring (DQM) system will be used to monitor their quality. A so called Keep-Up-Production (KUP) will reconstruct the data and these processed data will be used for detector status studies and for some prompt physics analysis. In order to validate the complete data processing chain, a Mock Data Challenge is being performed and will produce a large scale Monte Carlo data-set for the JUNO experiment.

Due to the rare signals, most of the JUNO expected events are backgrounds, coming from natural radioactivity of rocks, cosmic muons and from the detector itself. There are 17 different components considered in this Mock Data Challenge, and the simulation of each component is performed using the JUNO Distributed Computing Infrastructure (JUNO-DCI). The Monte Carlo output can then be used for the electronics and digitization simulation. However, the electronics simulation needs to simultaneously read a huge amount of data for each background component, and that makes the production on JUNO-DCI really challenging. A pre-mixing method is implemented to mix the radioactivity events beforehand so that the number of required input files can be significantly reduced: a radioactivity background event is picked from the existing data files according to the event rates and then saved into a pre-mixed data file.

In this contribution, details on the Mock Data Challenge, on the JUNO data processing logic-flow and on the practical challenges to be faced for a successful production, will be reported.

### Significance

This would be the first presentation focussed on the data processing chain of the JUNO experiment.

### References

### Experiment context, if any

JUNO

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**Session Classification:** Poster session with coffee break

**Track Classification:** Track 2: Data Analysis - Algorithms and Tools