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Computing model of the XENON experiments for dark matter search

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The XENON project is dedicated to the direct search of dark matter at LNGS.

XENON1T was the largest double-phase TPC ever built and operated so far, with 2 t of active xenon, decommissioned in December 2018. In the context of rare event search detectors, the amount of data (in the form of raw waveform) was significant: order of 1 PB/year, including both Science and Calibration runs. The next phase of the experiment, XENONnT, is under construction at LNGS, with a 3 times larger TPC and correspondingly increased data rate. Its commissioning is expected by the end of 2019.

We describe the computing model of the XENON experiments, with details of the data transfer and management, the massive raw data processing, and the production of Monte Carlo simulation.

All these topics are addressed using in the most efficient way the computing resources spread mainly in the US and EU, thanks to the OSG and EGI facilities, including those available at CNAF.

Primary authors: CESINI, Daniele (CNAF); SELVI, Marco (BO); ON BEHALF OF THE XENON COLLABORATION

Presenter: CESINI, Daniele (CNAF)

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