

Prospects of GPGPU in the Offline Software Framework

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The Pierre Auger Observatory is the currently largest experiment dedicated to unveil the nature and origin of the highest energetic cosmic rays. The software framework ‘Offline’ has been developed by the Pierre Auger Collaboration for joint analysis of data from different independent detector systems used in one observatory. While reconstruction modules are specific to the Pierre Auger Observatory components of the Offline framework are also used

by other experiments. The software framework has recently been extended to incorporate data from the Auger Engineering Radio Array (AERA), the radio extension of the Pierre Auger Observatory. The reconstruction of the data of such radio detectors requires the repeated evaluation of complex antenna gain patterns which significantly increases the required computing resources in the joint analysis. In this contribution we explore the usability of massive parallelization of parts of the Offline code on the GPU. We present the result of a systematic profiling of the joint analysis of the Offline software framework aiming for the identification of code areas suitable for parallelization on GPUs. Possible strategies and obstacles for the usage of GPGPU in an existing experiment framework are discussed.

Primary author: Dr WINCHEN, Tobias (University of Wuppertal)

Co-authors: Dr RAUTENBERG, Julian (University of Wuppertal); Mr GOTTOWIK, Marvin (University of Wuppertal)

Presenter: Dr WINCHEN, Tobias (University of Wuppertal)

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