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The CMS Roadmap towards HL-LHC Software and Computing

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The Phase-2 upgrade of CMS, coupled with the projected performance of the HL-LHC, shows great promise in terms of discovery potential. However, the increased granularity of the CMS detector and the higher complexity of the collision events generated by the accelerator pose challenges in the areas of data acquisition, processing, simulation, and analysis. These challenges cannot be solved solely by increments in the computing resources available to CMS, but must be accompanied by major improvements of the computing model and computing software tools, as well as data processing software and common software tools. We present aspects of our roadmap for those improvements, focusing on the plans to reduce storage and CPU needs as well as take advantage of heterogeneous platforms, such as the ones equipped with GPUs, and High Performance Computing Centers. We describe the most prominent research and development activities being carried out in the experiment, demonstrating their potential effectiveness in either mitigating risks or quantitatively reducing computing resource needs on the road to the HL-LHC.

Significance

This presentation would be based on the documentation submitted to the LHCC for the November 2021 review of HL-LHC computing models, referenced below.

References

<https://cds.cern.ch/record/2815292?ln=en>

Experiment context, if any

Submitted on behalf of the CMS Collaboration. Abstract has been approved by the CMS Conference Committee.

Primary authors: PIPARO, Danilo (CERN); LETTS, James Robert (Univ. of California San Diego (US))

Presenter: PIPARO, Danilo (CERN)

Session Classification: Poster session with coffee break

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