

Development of RICH software using GPUs

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Simulation of optical photons take a significant amount of CPU time in many HEP experiments. GPUs have been used efficiently by the industry for ray tracing photons. Recently the JUNO neutrino experiment showed that a speedup factor of 1650 in the simulation of a Cherenkov detector can be achieved using GPUs. This level of improvement is impossible to obtain by other means.

The software interface package used by JUNO was adapted in LHCb to simulate a simple RICH system, as a proof of principle. Further developments are planned towards implementing this for the LHCb-RICH detector. This technology can be beneficial for different experiments that need to simulate optical photons. It can also facilitate future implementations of particle identification software in the GPUs such as those foreseen for LHCb.

The status and future prospects of this software will be described. Issues related to software maintenance also will be addressed.

Requested length

20 minutes

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