

Photon Propagation with GPUs in IceCube

Thursday, 11 September 2014 12:15 (45 minutes)

Describing propagation of a large number of photons in a transparent medium is a computational problem of a highly parallel nature. All of the simulated photons go through the same stages: they are emitted, they may scatter a few times, and they get absorbed. These steps, when performed in parallel on a large number of photons, can be done very efficiently on a GPU. The IceCube collaboration uses parallelized code that runs on both GPUs and CPUs to simulate photon propagation in a variety of settings, with significant gains in precision and, in many cases, speed of the simulation compared to the table lookup-based code. Same code is also used for the detector medium calibration and as a part of an event reconstruction tool. I will describe the code and discuss some of its applications within our collaboration.

Primary author: CHIRKIN, Dmitry (UW-Madison, U.S.A.)

Presenter: CHIRKIN, Dmitry (UW-Madison, U.S.A.)

Session Classification: Poster Session