Type: Talk

## Fast 3D track reconstruction for antiproton annihilation analysis using GPUs

Thursday, 11 September 2014 14:30 (30 minutes)

Fast 4pi solid angle particle track recognition has been a challenge in particle physics for a long time, especially in using nuclear emulsion detectors. In particular, the data rate from emulsion detectors, i.e. from a scanning microscope, is about 10-100 TB/day. Real-time 3D volume processing and track reconstruction of such a quantity of data without limiting the angular acceptance need a large amount of computation, in which the GPU technology plays an essential role. In order to reconstruct annihilations of antiprotons, a fast 4pi solid angle particle track reconstruction based on GPU technology combined with a multithread programming has been developed. By employing 3 state-of-the-art GPUs with a multithread programming, a 60 times faster processing, at least, of 3D emulsion detector data has been achieved with an excellent tracking performance in comparison with a single-thread CPU processing. This tracking framework will be used in a wide range of applications like analyses of antiproton annihilations and neutron dosimetry.

Primary author: Dr ARIGA, Akitaka (University of Bern)

**Co-authors:** Mr EHTESHAM, Alireza (University of Bern); Prof. EREDITATO, Antonio (University of Bern); Dr PISTILLO, Ciro (University of Bern); Dr AUGER, Martin (University of Bern); Dr KIMURA, Mitsuhiro (University of Bern); SCAMPOLI, Paola (NA); Dr BRACCINI, Saverio (University of Bern); Dr ARIGA, Tomoko (University of Bern)

Presenter: Dr ARIGA, Akitaka (University of Bern)

Session Classification: GPU in Offline, Montecarlo and Analysis (2/3)