

# A common real time framework for SuperKEKB and Hyper Suprime-Cam at Subaru telescope

*Monday 23 March 2009 14:40 (20 minutes)*

The real time data analysis at next generation experiments is a challenge because of their enormous data rate and size. The SuperKEKB experiment, the upgraded Belle experiment, requires to process 100 times larger data of current one taken at 10kHz. The offline-level data analysis is necessary in the HLT farm for the efficient data reduction.

The real time processing of huge data is also the key at the planned dark energy survey using the Subaru telescope. The main camera for the survey called Hyper Suprime-Cam consists of 100 CCDs with 8 mega pixels each, and the total data size is expected to become comparable with that of SuperKEKB. The online tuning of measurement parameters is being planned by the real time processing, which was done empirically in the past.

We started a joint development of the real time framework to be shared both by SuperKEKB and Hyper Suprime-Cam. The parallel processing technique is widely adopted in the framework design to utilize a huge number of network-connected PCs with multi-core CPUs. The parallel processing is performed not only in the trivial event-by-event manner, but also in the pipeline of the software modules which are dynamically placed over the distributed computing nodes. The object data flow in the framework is realized by the object serializing technique with the object persistence. On-the-fly collection of histograms and N-tuples is supported for the run-time data monitoring.

The detailed design and the development status of the framework is presented.

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**Session Classification:** Online Computing

**Track Classification:** Online Computing