

GPU-based HLT

- LHCb is moving to an all-software trigger. We are investigating running the entire first HLT state on GPUs. A working prototype exists that could run the full tracking at 40 MHz on ~500 GPUs (custom scheduler written, etc). The MIT group (non IRIS-HEP) already implemented the Kalman filter, simplified selections (similar to those in Run 2), and some technical aspects like encoding the reports, etc.
- Post-doc Dan Craik has recently started working on configuration (memory management, etc) and monitoring. We propose to bring this and subsequent general work of GPU-based triggers into IRIS-HEP (ML-based selections, etc).
- Team: me @ 0%, Dan Craik @ 50%.
- Time Frames: 1st review in June went well. Next review in December. The next 2 years are crucial for getting this system deployed.
- Risk: Biggest risk is LHCb not adopting the GPU-based trigger. (Next big step in that process is in December. June review very encouraging that this will be adopted.)
- Collaboration: Cincinnati in IRIS-HEP, handful of groups within LHCb.