

Allen: LHCb GPU-based trigger

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- LHCb is a CERN-based experiment that studies particle decays at the LHC (see talk by M. Peppe-Altarelli)
- Next year it will start taking data with a new trigger system in which the first level is handled by GPU's at an input rate of ~ 30 MHz. This system is called **Allen**



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- Next year it will start taking data with a new trigger system in which the first level is handled by GPU's at an input rate of ~ 30 MHz. This system is called **Allen**
- The lab at INFIERI would be about looking at (and using) the software of that trigger system
- You will be running on computers that uses the same (or equivalent) hardware (at a smaller scale of course)

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- What the lab is **not** about:
 - **Not** about introduction to CUDA/GPU (already covered in previous INFIERI)
 - **Not** about using GPU's for data analysis
- Though if students are interested I can provide material on that after the lab

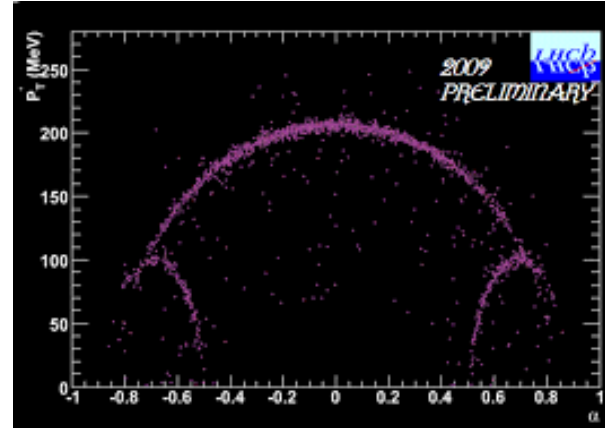
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- What we will be doing
 - Each student will be connected to a computer in Santiago, with access to an **Allen-compatible GPU** (NVIDIA RTX 3090, 3080Ti, or 2080 Ti as a backup)
- Part I: Get familiar with your card and how does Allen run
 - Try to optimize the options for the card model you are using
 - Given your optimization, calculate how many cards of that model would you need to be able to digest the entire input rate of the LHC

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- What we will be doing



- Part II: create a filter (trigger line) that selects V0 decays ($K_S \rightarrow \pi\pi$ & $\Lambda \rightarrow p\pi$)

- Create a basic filter
- Create an algorithm to produce an output file in ROOT for monitoring
- (Recompile and run on simulated data)
- Based on the output (and the time left), improve the cuts if needed and repeat.