WP-4 contribution

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Activity: WP-2, WP-4

Preliminary planning

- Event reconstruction on GPU (synergic with WP-2)
  - Patatrack
- Validation suite for GPU porting
  - RelVal[*] CPU vs RelVal[*] GPU
- GPU infrastructure expansion

[*]RelVal := “Release Validation”, set of plots produced at each code change integration for simulated events of different types and with different detector geometries (Run-3, Phase-II, …)

Patatrack contribution

- “Pixel track reconstruction running on GPUs”
  - initially developed and utilized at HLT
  - used for data taking since the start of Run-3
  - implemented in CUDA
    - code can run only on NVidia devices
    - need to maintain two code bases: for CPU and GPU
  - target: Run-3 and Phase-II
- Porting to **Alpaka** ongoing
  - expected by end of 2023
- Extension to Strips
  - evaluate Cellular Automaton performance including the Strip information

Validation and Infrastructure for GPU porting

The **increasing effort** of porting CPU code to GPU can benefit from a

1. common Validation suite
    - workflow(s) that automatically compares a set of RelVals produced with CPU-only code with a corresponding set of RelVals produced with code offloaded to GPU
2. larger pool of resources
    - currently only ten WLCG sites configured their GPU resources for CMS use
    - define a **standard procedure** for a WLCG site to make its GPUs available for CMS jobs
        - starting from T2_IT_Bari as pilot site