

# GPU Pixel Tracks at HLT: doublet generation

## *Status and plans*

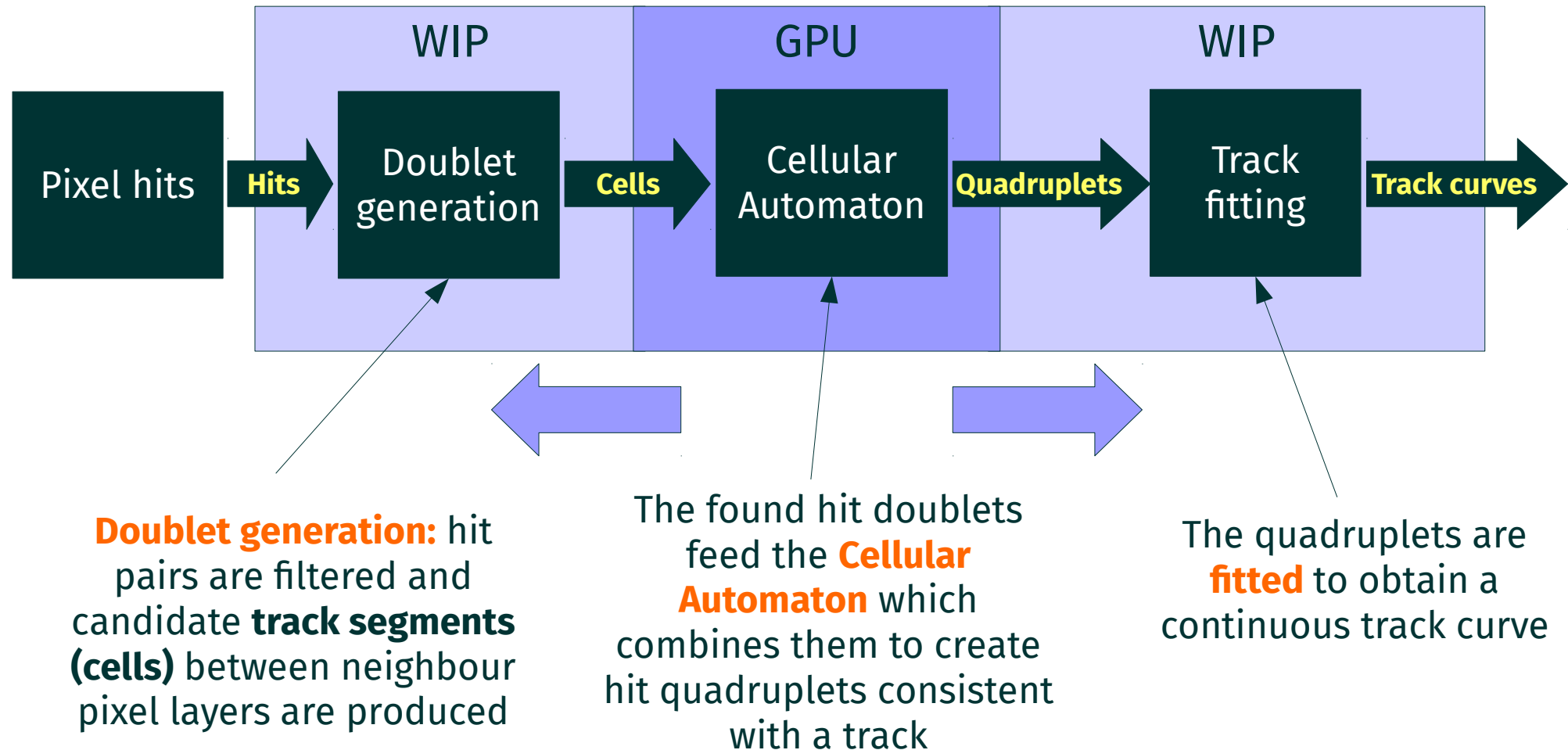
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# Track generation



## Section slide

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- Once that existing algorithms have been ported to GPU, we will work on improving the existing code
- First **priority**: **filtering of hits on the inner layer**
  - $\triangle$  **r and z filtering is performed by checking every hit that has passed the  $\varphi$  selection  $\triangle$** 
    - **Poor performance with high hit density**
- Two solutions have been suggested so far:
  - 1) **Splitting** the check between multiple threads
    - Re-uses the existing code
    - Can be implemented easily in short time
  - 2) **Pre-sorting** the hits in the r-z space using a **k-d tree** has been proposed
    - Trade-off in performance will be investigated
    - Might be vital in high pile-up environment

Backup

# Doublet generation

## *Multithreaded implementation*

- Each thread considers an outer hit in a layer pair:
  - It determines the  $\varphi$ ,  $r$  and  $z$  range of the compatible hits in the inner layer
  - It filters the inner hits and creates doublets

