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The Belle II silicon stand-alone track finder VXDTF2: experiences from the first Physics run and future prospects.

The VXDTF2 (VerteX Detector Track Finder 2nd) is the first implementation of a sector-map based track finder to be used on high energy Physics data, namely on the data collected by the Belle II experiment that is now recording the e+ e- collisions produced at the second generation B-factory SuperKEKB in KEK (Tsukuba). The main concepts of the algorithm and the design choices of the VXDTF2 implementation in C++ will be presented.
The main feature of the sector-map based track finders is the ability to learn the detector geometry and the detector material distribution from a Monte Carlo training sample. Different training strategies of the VXDTF2 will be compared in terms of track finding efficiency, fake rate, memory footprint and speed on data.
The machine background rate foreseen at nominal luminosity requires to exploit the hit time information provided by the silicon detector in the VXDTF2
in order to reduce the memory footprint, the fake rate and the CPU time.
The performances of the VXDTF2 at the expected machine background at nominal luminosity
with realistic hit timing performances of the detector will be finally presented.

Consider for young scientist forum (Student or postdoc speaker)

No

Second most appropriate track (if necessary)

Novel approaches and algorithms, and theoretical analysis

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