Contribution ID: **61** Type: **not specified**

Study of improvements of the tracking of very low transverse momentum particles in the Belle II experiment

Collisions produced at the interaction region of the Belle II experiment produce charged final state particles with a broad momentum spectrum from a few tens of MeV/c to several GeV/c. Highly efficient reconstruction of these charged particles as tracks with a low fake rate are essential for the success of the physics programme of Belle II. So far, the track finding efficiency is significantly lower for particles with transverse momenta below 100 MeV/c, i.e. particles from the interaction point that usually only traverse through the two silicon detectors of Belle II and don't leave enough signal in the drift chamber to be reconstructed there. In the proposed project, the student will use machine learning to identify signals of these very low momentum particles in the Silicon Vertex Detector (SVD) of Belle II based on their specific energy loss in the material. The goal is to increase the reconstruction efficiency of these particles, with particular focus on charged pions from decays of D*mesons in the process D* -> D pi, using both simulated events as well as data collected from collisions between 2019-2022 at the Belle II experiment. Basic knowledge of C++ and Python as well as notions of machine learning are desired but not required.

Group

FH - BELLE

Project Category

B1. Physics Data Analysis and Performance (software-oriented)

Special Qualifications

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