
Contribution ID: **108** Type: **Poster**

# Optimization of a First Level Neural Network z-Trigger for the Drift Chamber at the Belle II Experiment

*Tuesday, April 2, 2019 5:55 PM (5 minutes)*

For the Belle II experiment at the SuperKEKB asymmetric electron-positron collider (KEK, Japan) the concept of a first level track trigger, realized by neural networks, is presented. Using the input from a traditional Hough-based 2D track finder, the stereo wire layers of the Belle II Central Drift Chamber are used to reconstruct by neural methods the origin of the tracks along the beam (”z”) direction. A z-trigger for Belle II is required to suppress the dominating background of tracks from outside of the collision point. Extensive training and testing using simulated tracks achieve resolutions below 2 cm in the high Pt region, and below 5 cm in the low Pt region, sufficient for efficient background rejection. The importance of the correct drift time input from Belle's Event Time Finder on the optimal spatial resolution of the z-trigger is discussed. Background distributions from first data taking with Belle II are analyzed to optimize suitable z-cuts for an efficient background suppression.

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**Track Classification:** 2: Real-time pattern recognition, fast tracking and performance evaluation