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Particle identification with the TOP and AEROGEL detectors at Belle-II

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The SuperKEKB e+e- collider will provide 40 times higher instantaneous luminosity than the KEKB collider. The Belle-II detector, located at the collision point, is the upgrade of the Belle detector.

The particle identification in the barrel region will be improved by replacing the aerogel counter with a new high performance detector named time-of-propagation ("TOP").

The TOP sub-detector consists of 16 quartz radiator bars and 512 micro-channel-plate photomultiplier tubes ("MCP-PMTs"). The Cherenkov photons are produced and collected at the same time in the quartz radiator, after multiple internal reflections they are detected by the MCP-PMTs.

Photons with different Cherenkov angles reach different PMT channels and arrive at different time.

The time and the position convolution is used for the reconstruction of the Cherenkov angle.

The key features of the TOP counter, the performance study and the construction progress are presented.

Collaboration

Belle-II

Primary authors: TORASSA, Ezio (INFN Padova); Dr PESTOTNIK, Rok (Jozef Stefan Institute)

Presenter: TORASSA, Ezio (INFN Padova)

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