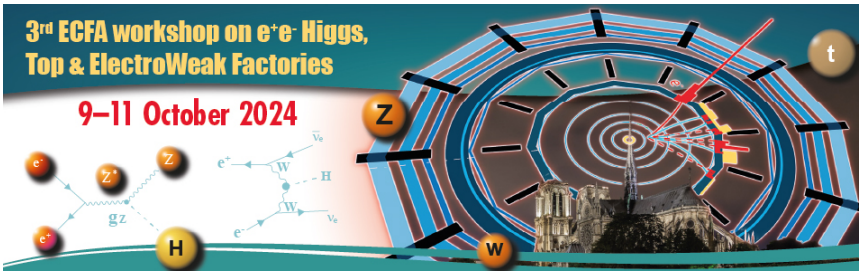

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The ARC compact RICH detector: reconstruction and performance

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PID will be essential in FCC-ee experiments for precision studies of heavy-flavour physics and Z, Higgs, W, and top decays.
In this context, a novel RICH detector concept, named ARC (Array of RICH Cells), has been proposed.
The ARC detector is designed to operate over a momentum range of 1-40 GeV, using both C_4F_{10} gas (or a more enviromentally-friendly equivalent) and Aerogel as radiators. The expected angular resolution of the ARC detector is on the order of milliradians, ensuring precise measurement of the Cherenkov angle.
The modular design of ARC includes identical cells, repeated to cover the entire external surface of the detector, with a radiator volume and a spherical mirror focusing the Cherenkov photons onto a SiPM photodetector plane. \\
A pattern-recognition algorithm has been implemented for this geometry. The Cherenkov angle is reconstructed using the particle's trajectory provided by the tracking system. This process is subject to various uncertainties due to the unknown photon emission point, limited knowledge of the photon detection point due to the pixel size, and chromatic dispersion, that are currently under evaluation. A pattern recognition approach, using likelihood calculations and iterative mass hypothesis adjustments, is under development for use when there are multiple tracks per event passing through a cell or if there are other significant backgrounds to be handled. The latest results of these evaluations will be presented and their implications for the ARC detector's performance discussed.

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