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A compact RICH for future Higgs Factory experiments

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Charged hadron identification up to high momentum is attracting increasing attention for experiments at a future Higgs Factory, both for the identification of Higgs decays and for the world-class flavour physics programme enabled by the enormous statistics foreseen at the Z. A compact RICH has been designed for such experiments, with a target of 20 cm radial extent and material budget of only a few percent of X_0. It involves an array of over a thousand similar hexagonal RICH cells tiling the barrel and endcaps, with dual radiators: silica aerogel and (currently) unpressurised C_4F_{10} gas. The design is being integrated into the FCC software framework for study with full simulation. Its development would profit from a wide range of R&D studies: compact, high efficiency sensors with sub-mm pixels sensitive to single photons (currently SiPMs assumed); alternative environmentally-friendly radiator gases; large-area high clarity aerogel tiles; lightweight spherical mirrors and vessel.

Requested length

10 minutes

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