

# A combined SiPM-based TOF+RICH detector

*Tuesday 16 May 2023 18:00 (15 minutes)*

A detector aiming to perform combined measurements of Time-of-Flight and Cherenkov photon angles is under development. The device consists of a proximity focusing RICH detector equipped with SiPMs as Cherenkov photon sensors. A 1 mm thin fused silica slab, acting as a second Cherenkov radiator, is coupled to the SiPMs for precise timing measurements due to the Cherenkov photoelectron statistics. The Cherenkov photons emitted by a charged particle traversing the fused silica slab result in a cluster of up to ten contiguous fired SiPMs (of 1x1 mm<sup>2</sup> size). Simulations and preliminary results from a beam test campaign anticipate a time resolution better than 20 ps by averaging over the SiPMs' stop times. The optimization of the two Cherenkov radiator refractive indices, the optical couplings, the SiPM's size, PDE and SPTR and the readout electronics is crucial in order to achieve the desired Cherenkov angle and time resolutions.

## Requested length

10 minutes

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**Session Classification:** Session 4