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SiPM studies for the ALICE 3 RICH detector

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The ALICE collaboration is proposing a new apparatus, ALICE 3, to investigate the Quark Gluon Plasma (QGP) properties, exploiting precise measurements of heavy-flavour probes as well as electromagnetic radiation. In this context, conceptual studies for the development of a RICH detector for ALICE 3 are ongoing. The proposed baseline layout is a proximity-focusing RICH, using aerogel ($n = 1.03$ at $\lambda = 400$ nm) as Cherenkov radiator and a layer of Silicon Photomultipliers (SiPM) for the photon detection, with an area of about 40 m^2 . The proposed detector represents the largest one using this technology. If sufficient time resolution can be achieved in the SiPM photon detectors, they can be able to identify charged hadrons via TOF measurements. The ongoing R&D studies on the SiPM sensors will be presented.

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