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The Arcadia R&D project: CMOS Fully depleted MAPS for FCC

The INFN Arcadia project has developed a technology platform for the design, development and production of fully depleted CMOS monolithic sensors with high collection efficiency. The main demonstrators consist of full chip side-abutable MAPS sensors (512 x 512 pixels for a total area of 1.28 cm x 1.28 cm) for the detection of charged particles and photons that have been characterized with radioactive sources and in test-beams. These demonstrators feature both a high-rate mode for high energy physics experiments and medical imaging and a low-rate mode for space applications. We propose these architectures for building the MAPS-based silicon pixel vertex detector and silicon tracker for FCC-ee.

The Arcadia project has also led to the design of pixel/strip test structures, fully depleted monolithic active microstrips, innovative CMOS monolithic LGADs with a gain layer for time-of-flight detectors and photon counting architectures for X-ray imaging. An overview of the various architectures will be given, together with the tracking performance measurements on the main demonstrators that have been achieved during a test-beam at Fermilab with a 3-layer telescope.

Title

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Topic

Solid state sensors

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