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Application of monolithic CMOS pixel sensors to a probe for radioguided surgery

In recent years, CMOS silicon pixel detectors have seen significant advancements and widespread usage across various physics fields, allowing for significant improvements in particle detection technologies. One relevant example is the ALPIDE chip, which is a CMOS Monolithic Active Pixel Sensor developed for the upgrade of the Inner Tracking System of the ALICE experiment at the LHC.

On top of its excellent capabilities for high-energy particle physics, its excellent spatial resolution and charged-particle detection efficiency, very limited noise and fake-hit rate, and reduced sensitivity to photons make it suitable for several applications in medical physics.

In this poster, we will show recent developments for an intraoperative probe containing an ALPIDE chip as a sensitive element, with online imaging capabilities, to be exploited in radioguided surgery in association with beta-emitting radiotracers.

In this regard, the design of the probe and the construction of a first functioning prototype will be discussed. Simulation studies for the investigation of the probe performance in discriminating tumoral tissues from healthy tissues, as well as first results from experimental studies with phantoms, will also be reported.

Category

Experiment

Collaboration (if applicable)

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