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Studies on MAPS devices for medical applications.

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The detection unity of the current Inner Tracking System of ALICE, called ITS2, is the ALPIDE sensor. This device is the result of an intensive R&D effort carried out in the last decade and has led to a quantum leap in the field of MAPS for single-particle detection, reaching unprecedented performance in terms of efficiency, spatial resolution, material budget and readout speed. The further upgrade of the inner tracking system, called ITS3, foresees the implementation of a new generation of large size, ultra-thin stitched MAPS, whose first prototype studies have shown promising results. The technological evolution of MAPS as commercial devices has extended their interest beyond the high-energy physics experiments. A varied range of medical applications can also benefit of the use of this innovative sensor technology. The feasibility of a system for computerised tomography with a proton beam, based on a large dimension high-segmentation hybrid calorimeter; the possible development of a Compton Camera based on a Pixel Chamber for on-line monitoring of hadron-therapy; and the potential usage of the ALPIDE chip as intraoperative probe for radio-guided surgery will be presented in this contribution.

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