The pixel module of the new Inner Tracking System of ALICE at LHC

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ALICE (A Large Ion Collider Experiment) is one of the four large detectors at the CERN LHC collider, designed to address the physics of strongly interacting matter, and in particular the properties of the Quark-Gluon Plasma (QGP) using proton-proton, proton-nucleus, and nucleus-nucleus collisions.

Despite the success already reached in achieving these physics goals, there are several measurements still to be finalized, like high precision measurements of rare probes (D mesons, Lambda barions and B mesons decays) over a broad range of transverse momenta.

In order to achieve these new physics goals, a wide upgrade plan was approved that combined with a significant increase of luminosity will enhance the ALICE physics capabilities enormously and will allow the achievement of these fundamental measurements.

The Inner Tracking System (ITS) upgrade of the ALICE detector is one of the major improvements of the experimental set-up that will take place in 2019-2020 where the whole ITS sub-detector will be replaced with one realized using a innovative Monolithic Active Pixel silicon Sensor (MAPS), called ALPIDE. The upgraded ITS will be realized using more than twenty-four thousand ALPIDE chips organized in seven different cylindrical layers, for a total surface of about ten square meters.

The main features of the new ITS are a low material budget, high granularity and low power consumption. All these peculiar capabilities will allow for full reconstruction of rare heavy flavor decays and the achievement of the physics goals.

In this talk after an overview of the whole ITS upgrade project, the construction procedure of the basic building block of the detector, namely the module, and its characterization in laboratory will be presented.

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