ID de Contribution: **135** Type: **Oral presentation**

Development of MAPS with Intrinsic Amplification.

The requirements for future tracking and vertex detectors are pushed towards improvement of timing and spacial resolutions as well as decreasing of power consumption. The monolithic CMOS pixel sensors (MAPS) offer good compromise between demanding requirements, by optimization of different blocks: sensing element (pn charge collection diode), amplifier (front end and discriminator) and digital processing circuitry.

One can combine charge collection and amplification functions in a single block, replacing the pn diode by an avalanche diode. Such a structure allows intrinsic charge multiplication in silicon. In this case there is no need for a front end circuit or it can be simplified, hence one can further reduce power consumption and surface occupied by the pixel.

The development of low gain avalanche diodes (LGAD) which can work as sensing element and front end circuit in MAPS is conducted by the APICS project.

The TCAD simulations of different low gain avalanche diode (LGAD) structures revealing the potential challenges and possible solutions will be discussed. The simulated structures are implemented in small scale test chips which fabrication shall start at the end of 2025. Ongoing preparation for measurements will be presented.

Title

Development of MAPS with Intrinsic Amplification.

Topic

Solid state sensors

Auteur: DOROKHOV, Andrei (IPHC)

Orateur: DOROKHOV, Andrei (IPHC)