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PSI Platform for Semiconductor Materials Characterization and Electronic Device Testing

The PSI technical platform at IJCLab has been created in 2021 to provide advanced testing and characterization means for semiconductor devices. It is equipped with a probe station, a digital microscope, a 3D metrology system, climate chambers and controlled-atmosphere storage cabinets, which are distributed across a 70 m² clean room and a test room. The platform is designed to support a wide range of activities, including electrical characterization (I-V, C-V, etc.), visual inspection, precision metrology, radioactive source testing and thermal cycling, both in R&D and production phases.

IJCLab plays a major role in the HL-LHC upgrade, leading the assembly and production of silicon modules for ATLAS/ITk, ATLAS/HGTD detectors, which includes the assembly of the module components and the electrical tests at many steps of the production sequence. After a successful R&D phase, an intensive production campaign is planned between 2025 and 2027, involving around 1200 modules for ITk-Pixel and 2000 modules for HGTD.

In parallel, ongoing R&D focuses on SiW-ECAL, developing a highly-segmented calorimeter with PIN diodes for a future Higgs factory, and on EIC-Roman Pots, advancing AC-LGAD sensors and the EICROC chip for high-precision tracking at the EIC. Current activities include sensor I-V testing and prototype validation with a beta source at PSI.

Looking forward, the PSI platform aims to expand its role as a shared infrastructure, opening to external institutional and industrial partners, and positioning itself as a key facility for the development of next-generation semiconductor detector technologies.

Title

Topic

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