

光量子計測器開発部門

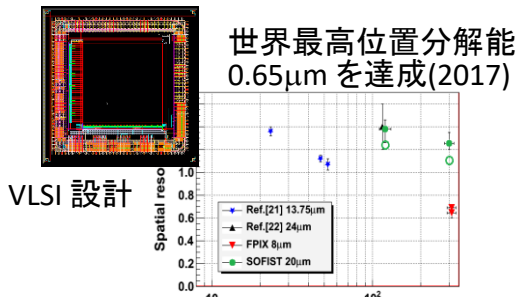
☆先端検出器で各プロジェクトの推進を支え、新しい物理計測を可能にする

進展の著しい先端光・量子検出器は、様々な物理計測限界を超越する可能性があります。光・量子検出器開発部門では、各プロジェクトの推進を支え、さらに「TIA連携等を通じて新しい検出器技術の開発を推進します。

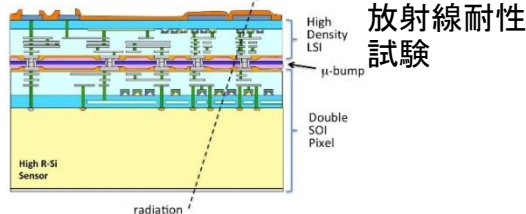
● 朝永センター各部門との密接な連携のもとに 光・量子検出器を開発

ATLAS実験やALICE実験の検出器増強に用いるシリコン半導体検出器、COBAND実験用STJ、その他、朝永センターが推進する様々なプロジェクト用の検出器の開発研究を密接な連携をもって推進します。

● TIA連携で先端検出器の開発



3D積層により機能を一層拡張し、ILC用ピクセルを設計する

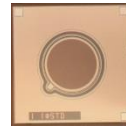
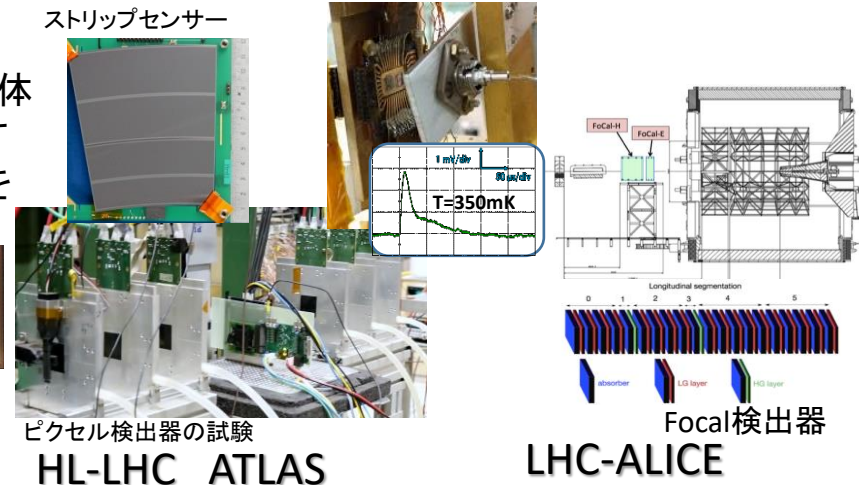


SOI モノリシックピクセル

COBAND

STJ+SOI増幅器試験

ストリップセンサー



ピクセル検出器の試験

HL-LHC ATLAS

LHC-ALICE

TIA(Tsukuba Innovation Arena)は筑波地区の5研究機関が連携して光量子センシングスクエアを形成し、新しい科学と産業の創成を目指します。

SOIは読み出し回路一体型の先端半導体検出器で、VLSIの設計・製作を通じ、さらに先端の μ バンプ技術を用いた3次元積層で、検出器の機能をさらに飛躍させます。センシングスクエアにはSTJと大型構造イメージングプロジェクトも参画しています。

Division of Photon and Particle Detectors

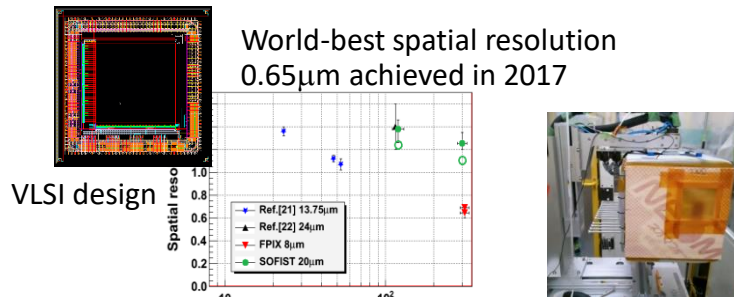
★ Advance detectors drive the projects, enabling new physics measurements

Advanced detectors based on new technologies promote and enable measurements of various physics in the area beyond the current limitations. The Division supports R&D of new detectors within the projects of other Divisions, and develops innovative detectors in the framework of TIA activities.

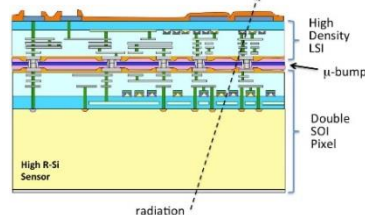
● Develop PPDs in close linkage with other TCHoU Divisions

Developments of silicon semiconductor devices for ATLAS and ALICE detector upgrades, STJs for COBAND project, and detectors for other TCHoU projects are push forward by the Division by exchanging knowledge and expertise. (Details can be found in the corresponding project pages)

● Innovative detectors in TIA

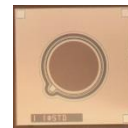


3D stacking enhances the sensor capability, e.g, for ILC experiment

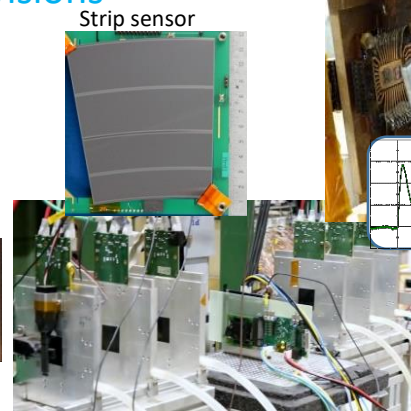


SOI monolithic detector

Rad-hard detector R&D



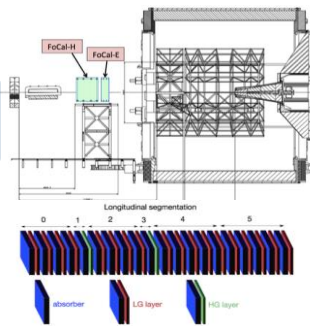
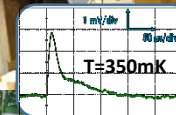
LGAD



HL-LHC ATLAS

COBAND

STJ+SOI amp



Focal detector
LHC-ALICE

TIA (Tsukuba Innovation Arena) brings together the potentials and resources of five organizations in Tsukuba area, where Sensor & Imaging Square is organized for developments of new detectors, creating new scientific fields and industries.

Innovative monolithic pixel detectors are being realized by SOI technology. VLSI design/fabrication is made in collaboration with KEK and VDEC (U Tokyo). 3D stacking using μ -bumps enhances further the sensor capability.

STJs and Imaging of massive objects (muon-radiography) are also the projects included in the Square.