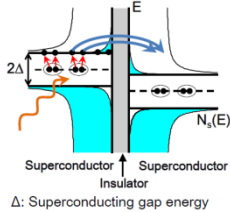
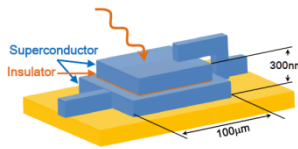


Development Projects of Photon and Particle Detectors

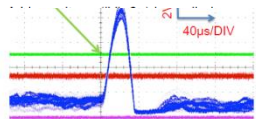
Basic development projects of the photon and particle detectors

Superconducting Detectors

- Superconductor / Insulator / Superconductor Josephson junction device



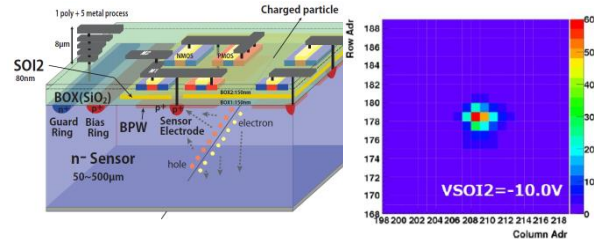
Δ: Superconducting gap energy



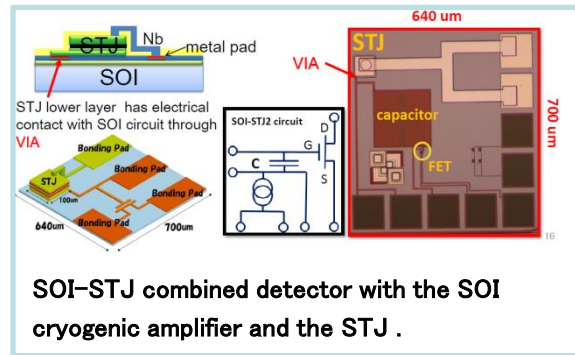
Pulse height dispersion is consistent with 10-photon detection in STJ

Superconducting Tunnel Junction (STJ) detector structure (top) and its response to visible laser light (bottom).

SOI Technology

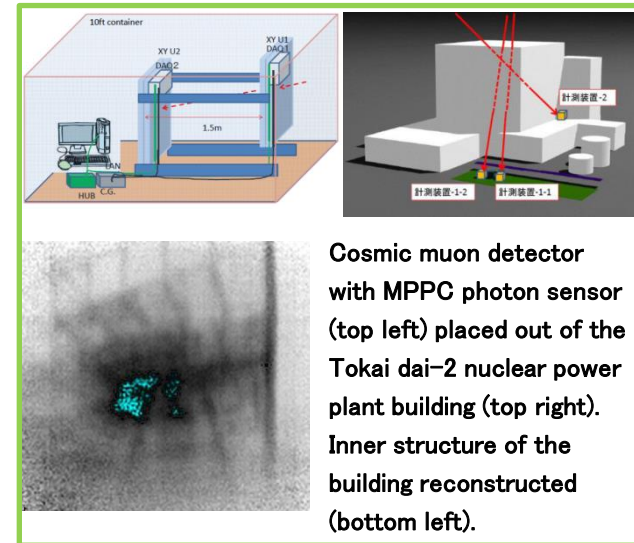


SOI pixel detector which combine the pixel detector with SOI technology electronics on a board (left) its response to infrared laser after 100kGy gamma ray irradiation (right).



SOI-STJ combined detector with the SOI cryogenic amplifier and the STJ .

Large-scale Structure Imaging using muon detectors with MPPC photo-sensors



Cosmic muon detector with MPPC photon sensor (top left) placed out of the Tokai dai-2 nuclear power plant building (top right). Inner structure of the building reconstructed (bottom left).

1. Superconducting detector: Far-infrared photon counter, Photon and particle detector with high energy resolution for the studies of the History of the Universe and the applied sciences and the industrial use.
2. SOI technology: High density electronics, cryogenic electronics, and particle pixel detector for the studies of the History of the Universe and the applied sciences and the industrial use.
3. MPPC for large-scale structure imaging: Cosmic muon detector to study cosmic ray physics, to diagnose the large-scale structure and to predict the volcanic eruption.

Based on the investigation of the proposal on a new detector technology for the fundamental science and the industrial use, new detector project will be started in the Laboratory for Development of Photon and Particle Detectors.