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Beamtest of novel n-in-p strip sensors for very high radiation environment

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Results on a beam test of n-in-p silicon strip sensors aimed for the ATLAS SCT(Semi-Conductor Tracker) upgrades for High Luminosity LHC(HL-LHC) are presented. This Beam test was operated with a new DAQ system consisting of a universal read-out board called 'SEABAS'and a beam tracking system with the spacial resolution less than 5 micro meters, and held at RCNP in December 2011. Behaviors of the new 1 cm x 1 cm n-in-p miniature sensors before and after irradiation up to 10ˆ15 n_eq/cmˆ2 are discussed. Collected charge of non-irradiated is sensor is 6fC at full depletion voltage, while of 10ˆ15 n_eq/cmˆ2 irradiated sensor is 4.2fC. The effective region on the strip edges around PTP structures of the non-irradiated sensor reached to the bias rail, while of the 10ˆ15 n_eq/cmˆ2 irradiated sensor it reached only up to strip edges.

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