

On biasing the ATLAS SCT Barrel modules

Y. Nakamura^a, K. Hara^a, K. Nakamura^a, K. Inoue^a,
S. Shinma^a, Y. Ikegami^b, T. Kohriki^b, S. Terada^b, Y. Unno^b

^a Graduate School of Pure and Applied Sciences, University of Tsukuba, 1-1-1
Tennodai, Tsukuba, Ibaraki 305-8571, Japan

^b High Energy Accelerator Research Organization (KEK), Oho 1-1, Tsukuba,
Ibaraki 305-0801, Japan

Abstract

We observed deteriorated IV curves when ATLAS SCT silicon microstrip detector was biased for a long period. The leakage current is nearly halved at voltages below V_k where the detector was kept biased. At these voltages, the noise figure is deteriorated and signal charge is spread across the neighboring strip. The detector performance is, however, not degraded at V_k or above. This problem disappears by setting off the bias voltage but it requires a certain time which is dependent on the temperature. We characterized the phenomena in detail and propose to inhibit specific biasing scheme in the experiment.
