

Horizontal test of Superconducting RF gun #2 at KEK

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Superconducting radio-frequency (SRF) electron guns are attractive for delivery of beams at a high bunch repetition rate with a high accelerating field. KEK has been developing the SRF gun to demonstrate basic performance. The SRF gun consists of 1.3 GHz and 1.5 cell SRF gun cavity and K₂CsSb photocathode coated on 2K cathode plug. In the vertical test, the surface peak electric field and the surface peak electric field reached to 75 MV/m and 170 mT respectively. The SRF gun was installed to horizontal multipurpose cryostat equipped with a superconducting solenoid, photocathode preparation chamber and beam diagnostic line. Unfortunately, the peak surface gradient dropped to 42 MV/m. This was probably due to particulate issued that entered the cavity during assembly. We suspect that it was caused particulate are come into the cavity during assembly. In this presentation, we will describe the high gradient performance in vertical and horizontal test and individual test for each beam line components.

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