



Contribution ID: 301

Type: **Poster**

Status of a 140 keV electron source for high current linac

Wednesday, 21 June 2017 13:30 (1h 30m)

LEETCHI is an electron source designed to produce 140 keV, 5 A, 140 μ s beams at a repetition rate of 50 Hz. The shot to shot and flat top current stability of this drive beam injector for CLIC has to be better than 0.1 % and a normalized emittance of 14 mm.mrad is expected. A test stand has been build which allows to diagnose and dump the beam produced by a thermionic cathode. The thermionic cathode is equipped with a grid which will allow us to control the current and eventually to have a feedback on the flattop shape. Results with few μ s pulses lengths are presented. The analysis shows a very good stability of the LEETCHI experiment.

OTR measurements with short pulses are compared with Particle In Cells and tracking simulations. These comparisons are used to estimate the emittance of the beam.

First results at 5 Amperes, 140 μ s pulse duration and low repetition rate, show the capability of this gridded cathode to resist to the thermal constrains.

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Session Classification: Poster session III - Particle Beam and Accelerator Technologies

Track Classification: Particle Beam and Accelerator Technologies