



Contribution ID: 904 Contribution code: THAN1

Type: Contributed Oral Presentation

## Design, realization and high power RF test of the new brazed free C band photo-gun

Thursday, 23 May 2024 09:30 (20 minutes)

RF photo-gun are the electron beam sources of FELs or Compton facilities. They are key components and, presently, the RF technology mostly used for these devices is the S band (3 GHz) with typical cathode peak fields of 80-120 MV/m and repetition rates lower than 100-120 Hz. An innovative C-Band (5.712 GHz) RF gun aiming at reaching cathode peak field larger than 160 MV/m, with repetition rates exceeding the 400 Hz, has been designed, realized and high power tested in the context of the European I.FAST and INFN Commission V projects. It is a 2.5 cell standing wave cavity with a four-port mode launcher, designed to operate with short RF pulses (300 ns). Its realization is based on the new brazed-free technology developed and successfully tested at INFN. In the paper, after a short overview of the design and RF gun capabilities, we illustrate the realization procedure and the results of the high power RF tests that have been done at the high power C band test facility at PSI (Switzerland).

### Footnotes

### Funding Agency

European Union's Horizon 2020 Research and Innovation program under GA No101004730 and from the INFN Commission V

### Paper preparation format

Word

### Region represented

Europe

**Primary author:** ALESINI, David (Istituto Nazionale di Fisica Nucleare)

**Co-authors:** GALLO, Alessandro (Istituto Nazionale di Fisica Nucleare); VANNOZZI, Alessandro (Istituto Nazionale di Fisica Nucleare); GIZZI, Alessio (Istituto Nazionale di Fisica Nucleare); LIEDL, Andrea (Istituto Nazionale di Fisica Nucleare); GIRIBONO, Anna (Istituto Nazionale di Fisica Nucleare); BEARD, Carl (Paul Scherrer Institut); VACCAREZZA, Cristina (Istituto Nazionale di Fisica Nucleare); CARDELLI, Fabio (Istituto Nazionale di Fisica Nucleare); DI RADDIO, Gianluca (Istituto Nazionale di Fisica Nucleare); FICCADENTI, Luca (Sapienza University of Rome); PIERSANTI, Luca (Istituto Nazionale di Fisica Nucleare); FAILLACE, Luigi (Istituto Nazionale di Fisica Nucleare); PELLEGRINO, Luigi (Istituto Nazionale di Fisica Nucleare); PEDROZZI, Marco (Paul Scherrer

Institut); FERRARIO, Massimo (Istituto Nazionale di Fisica Nucleare); CRAIEVICH, Paolo (Paul Scherrer Institut); LAUCIANI, Stefano (Istituto Nazionale di Fisica Nucleare); LUCAS, Thomas (Paul Scherrer Institute); LOLLO, Valerio (Istituto Nazionale di Fisica Nucleare)

**Presenter:** ALESINI, David (Istituto Nazionale di Fisica Nucleare)

**Session Classification:** THAN: Novel Particle Sources and Acceleration Techniques (Contributed)

**Track Classification:** MC3: Novel Particle Sources and Acceleration Techniques: MC3.T02 Electron Sources