IPAC'23 - 14th International Particle Accelerator Conference



Contribution ID: 2246 Contribution code: MOPL095

Type: Poster Presentation

Update on the FCC-ee positron source design studies

Monday 8 May 2023 16:30 (2 hours)

The studies and R&D on the high-intensity positron source for the FCC-ee have been initiated for a while. The positrons are produced by a 6 GeV electron drive-beam incident on a target-converter at 200 Hz. The drive beam comes in 2 bunches spaced by 25 ns with a maximum charge of ~5 nC per bunch. Two scenarios using conventional and hybrid targets are being studied for positron production. According to the FCC CDR, the Flux Concentrator is used as the matching device for the capture system, followed by several accelerating structures embedded in the solenoidal field. Then, the positrons are further accelerated to be injected into the damping ring. Recently, the feasibility study on using a SC solenoid for the positron capture has been started, and the design based on the HTS technology is under investigation. In addition, the large aperture 2 GHz RF structures, which have been specially designed for the FCC-ee positron capture system, are used with the goal of demonstrating accepted positron yield values well beyond the values obtained with state-of-the-art positron sources. The purpose of this paper is to review the current status of the FCC-ee positron source design, highlighting the recent research into the positron production, capture system, primary acceleration, and injection into the damping ring.

Funding Agency

This work was done under the auspices of CHART Collaboration. ANR under Grant No: ANR-21-CE31-0007 and the European Union's Horizon 2020 Research and Innovation programme under Grant No 101004730.

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: CHAIKOVSKA, Iryna (Université Paris-Saclay, CNRS/IN2P3, IJCLab)

Co-authors: BACCI, Alberto (Istituto Nazionale di Fisica Nucleare); LATINA, Andrea (European Organization for Nuclear Research); LECHNER, Anton (European Organization for Nuclear Research); PERILLO MAR-CONE, Antonio (European Organization for Nuclear Research); HUMANN, Barbara (Vienna University of Technology); AUCHMANN, Bernhard (Paul Scherrer Institut); ALHARTHI, Fahad (Université Paris-Saclay, CNRS/IN2P3, IJCLab); KOSSE, Jaap (Paul Scherrer Institut); GRENARD, Jean-Louis (European Organization for Nuclear Research); ROSSETTI CONTI, Marcello (Istituto Nazionale di Fisica Nucleare); SCHAER, Mattia (Paul Scherrer Institute); DUDA, Michal (Institute of Nuclear Physics Polish Academy of Sciences); Dr CRAIEVICH, Paolo (Paul Scherrer Institut); MARTYSHKIN, Pavel (Russian Academy of Sciences); MENA ANDRADE, Ramiro (European Organization for Nuclear Research); ZENNARO, Riccardo (Paul Scherrer Institut); CHEHAB, Robert (Laboratoire de Physique des 2 Infinis Irène Joliot-Curie); MYTROCHENKO, Viktor (National Science Centre); ZHAO, Yongke (Shandong University); ENOMOTO, Yoshinori (High Energy Accelerator Research Organization)

Presenter: CHAIKOVSKA, Iryna (Université Paris-Saclay, CNRS/IN2P3, IJCLab)

Session Classification: Monday Poster Session

Track Classification: MC1: Colliders and other Particle Physics Accelerators: MC1.A02: Lepton Circular Colliders