



ID de Contribution: 88

Type: Non spécifié

The SRF ERL Based FEL Test Facility at Peking University

Abstract: To provide coherent radiations, the construction of a SRF (Superconducting Radio Frequency) ERL (Energy Recovery Linac) test facility (PKU-SETF) was initiated by the PKU-SRF group in 2005 as a mid-term goal. The PKU-SETF consists of mainly a 5 MeV DC-SRF injector, a cryomodule of 9-cell TESLA cavity working at 2 K for accelerating electrons to 15-20 MeV and an energy recovery beam transport loop with two arcs, which is designed to match the main accelerator. An undulator and a chicane compressor are inserted in the loop to produce FEL with 4-8 micron wave length. The PKU-SETF will be implemented in 3 steps. For the first step, the 5 MeV beam from the DC-SRF injector will be injected directly to an undulator to produce THz radiation. After the main accelerator and the energy recovery loop being commissioned, an ERL-CBS (Compton Backscattering) device will be constructed to produce high flux X-ray of ~10 keV. Finally with an 11.5 m long optical cavity, the IR laser can be obtained. As a result, PKU-SETF will be able to provide users with various kinds of radiations according to their needs. To realize these goals, 2-cell, 3.5-cell and 9-cell TESLA type cavities, made of both large and fine grain Nb, have been developed at PKU. Accordingly cryomodule of DC-SRF injector and the main accelerator have been constructed. As the commissioning of the 2 K cryogenic system will be finished by the end of March, it is expected to get the 1st 5 MeV e-beam from the DC-SRF photo-injector by the end of this year. The layout of PKU-SETF and structures of the injector and main accelerator as well as main parts of the ERL ring will be presented.

Auteur principal: Prof. CHEN, jia'er (Institute of Heavy Ion Physics, Peking University)

Co-auteurs: Prof. LIU, Ke Xin (Institute of Heavy Ion Physics, Peking University); Prof. ZHAO, Kui (Institute of Heavy Ion Physics, Peking University)

Orateur: Prof. CHEN, jia'er (Institute of Heavy Ion Physics, Peking University)