Joint DESY and University of Hamburg Accelerator Physics Seminar

Tuesday, 09.09.2014

(16:00 in Room 459/30b)

Operation of the Superconducting Linear Accelerator and Design of a Proposed Light Source at Delhi (LSD)

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Abstract

A 16 MV Pelletron accelerator is operational at Inter University Accelerator Centre since early nineties. To augment the beam energy from Pelletron, a superconducting (SC) linear accelerator has been installed and made operational. The prototype and the first batch of twelve niobium resonators were built in collaboration with Argonne National laboratory, USA. The remaining fifteen resonators were fabricated in–house by using the indigenous facility. Since last 5 years, accelerated ion beam from SC Linac is being delivered for scheduled experiments. Simultaneously, IUAC is also involved in the fabrication of spoke resonators for Fermi-Lab, USA for project–X.

Recently, a plan to develop a compact light source at IUAC has been conceived. In its first phase, a room temperature photocathode RF gun will be developed to produce a pre-bunched high quality electron beam (7 MeV) and coherent THz will be produced from the beam by a short undulator magnet. In the second phase, a 1.3 GHz, 3.5 cell superconducting RF gun will be developed to produce a $\sim$10 MeV high quality electron beam. This beam will also be used to produce THz radiation and will be injected into two 1.3 GHz, 9 cell niobium cavity to increase the energy from 10 MeV to $\sim$40 MeV. This beam will be used to produce far–IR, IR radiation by a long undulator magnet and X-rays by Inverse Compton Scattering.

The major interesting developments for superconducting linac will be presented along with the description of the facilities to fabricate niobium resonators at IUAC. The detail planning of the Light Source at Delhi will be presented and the specification of the electron beam, laser device, Klystron, the radiation emitted from the electron beam etc. will be discussed. All suggestions, comments will be appreciated.

J.Roßbach (Univ. HH) and M.Vogt (MFL).

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