

Beam Development and Utilization Program of Kolkata Superconducting Cyclotron

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The Kolkata superconducting cyclotron has been successfully commissioned with internal beam. About 60 nA, 175 MeV Argon beam has been used to irradiate an aluminium target at extraction radius and the resulting neutron and gamma spectrum have been recorded. After three weeks of continuous operation, the machine had been opened for installation of beam extraction elements, viz., two electrostatic deflectors, nine magnetic channels and 5-meter long external beam line. At the time of submitting this abstract, the machine has been closed shut again and beam chamber evacuation is in progress. Very soon, external beam will be available to the experimentalists. The superconducting cyclotron will provide opportunities to probe the frontier areas in nuclear physics around the Fermi energy domain. Several experimental facilities are being developed at VECC as a part of the utilization programme. These include, a general-purpose scattering chamber, 4π charged particle detector array, 4π neutron multiplicity detector, TOF neutron detector array and high-energy gamma detector array. The three segment cylindrical scattering chamber is one of the largest in the country, providing the unique opportunity to mount various kinds of detector systems in different geometry and to carry out TOF measurements involving large flight paths. It has already been installed in the beam hall-1 of the superconducting cyclotron. In this paper, we discuss about the beam development activities with Kolkata superconducting cyclotron and its utilization program.

The up-gradation program of different sub-systems of K130 cyclotron to improve the overall performance of the same has recently been over. The old synthesized signal generator as well as the 1 kW power distributed amplifier have been replaced for better stability of the RF system. All the 30 years old power supplies have been replaced. Computerized control system has been developed for the operation of various sub-systems. Currently this cyclotron is being refurbished to use it as the primary source for the upcoming Radioactive Ion Beam (RIB) Facility at VECC. It is expected to deliver alpha beam by the end of November this year.