Director's Report

The Inter-University Accelerator Centre continues to serve the large community of users from the Universities and upgrade the facilities to remain internationally competitive. The Pelletron accelerator operated with excellent uptime and the tank had to be opened only once this year due to use of better stripper foils. The AMS facility for ^{10}Be and ^{26}Al measurements is in operation and several new projects related to geology have been undertaken.

A new 1.7 MV facility with an alphatross ion source has been installed at IUAC and was inaugurated by Secretary, MHRD on 1st March 2011. This facility is now open for the users for their experiments. At present it is capable of accelerating protons and alpha beams for use in research and is already being used for RBS and channelling experiments and is capable of detecting elements from Boron to Uranium. It is a major additional tool for characterisation of materials.

The Pelletron accelerator and the first accelerating module of LINAC along with its Superbuncher and Rebuncher are being used to deliver ion beams for experiments in beam Hall-2. The LINAC operated very smoothly for a continuous period of two months and steps taken to automate the operation proved successful. Several of the newly fabricated resonators were tested and found to give very high accelerating gradients and these are in the process of installation in the 2nd cryostat. The 3rd cryostat is also integrated in the beam line. The two 1.3 GHz single cell TESLA cavities welded here under collaboration with RRCAT, were tested at Fermilab, USA and found to perform up to a field of 23 MV/m and holds promise of achieving higher gradients in future. The cryogenics group has fabricated and tested successfully a cryofree high Tc superconducting magnet that achieved 6.3 T field at a 5 cm diameter warm bore. This will be used magnetic measurements in future by the users.

Good overall progress was achieved in the High Current injector (HCI) project. The beam optics of the HCI has been worked out in detail and the beam line layout has been finalised after a lot of deliberations on alternate layouts. The beam hall III is getting ready and we hope to shift the ECR source to the new beam hall next year. The RFQ prototype has been powered to 20 kW successfully and now the full RFQ for the HCI would be fabricated. The first tank module for the Drift Tube LINAC has been received from the vendor and is undergoing tests.

With the INGA at TIFR, the emphasis of experiments in Nuclear Physics last year has been on studying role of shell closure in fusion-fission reactions, projectile structure effects in incomplete fusion, measurement of lifetime of excited states using recoil distance

method and g-factors of excited states using perturbed angular distributions in a magnetic field. The TIFR 4π spin spectrometer was installed in the HYRA beamline and used for spin gated measurements of GDR in the heavy nuclei. The materials science facilities continue to support the research programmes of a large number of users from different universities and institutions. A GM based closed cycle refrigerator was funded by nano mission of DST, New Delhi to cool the samples down to 10K. This system has been tested and installed with existing X-ray diffractometer and will provide users with an unique in-situ facility. A new high intensity gamma irradiation chamber has been installed.

All the support laboratories continued to provide efficient service to the users throughout the year.

The teaching laboratory has produced this year a newer version of the Phoenix kit with a USB connection that makes it more versatile.

We expect to complete the LINAC next year and start the low energy beam facility in the new hall that will allow the users to perform an wider range of experiments.

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May 2011