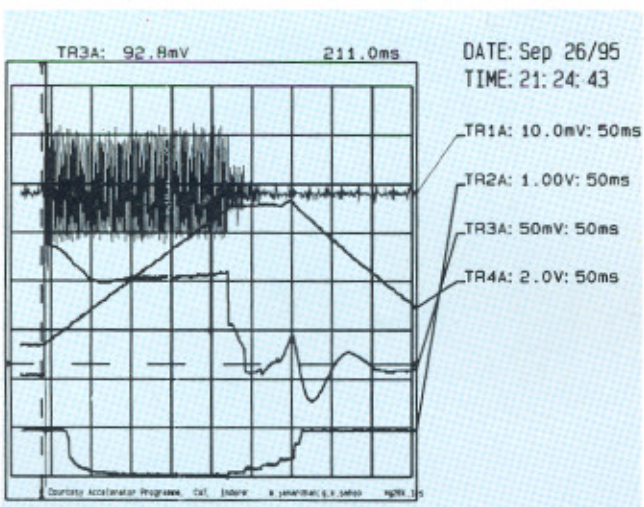
Atlas of Methanol Transitions

A book on atlas of all known microwave, infrared and laser transitions of methanol, co-authored by Dr I Mukhopadhyay, CAT has been published by the CRC press, USA. This atlas contains about 35,000 precise line positions with their quantum number assignments and empirical intensities. The accuracy of the microwave, millimeter wave and frequency measured FIR line positions is better than ±0.1 MHz and the corresponding accuracy for the Fourier transform peaks is of the order of ±6 MHz. These peak lists have been recommended as one of the primary and secondary wave number standards for the FIR region by the International Union of Pure and Applied Chemistry (IUPAC) and should prove valuable for identifying methanol transitions from interstellar clouds. The atlas also provides the most comprehensive catalogue of known optically pumped FIR laser lines from methanol, which is the richest source of FIR laser lines.

ACCELERATOR PROGRAMME

Commissioning of Booster Synchrotron for Indus-1

A booster synchrotron has been developed at CAT for increasing the electron beam energy from 20 MeV to 450 MeV for injection in Indus-1. The energy is imparted to electrons by an RF cavity. As the energy is gained by electrons, to keep them in a stationary orbit the magnetic fields of dipole, quadrupole etc. are increased synchronously. Once the peak energy is reached the corresponding magnetic field is maintained at this value for about 100 msec during which the beam is extracted. After this the fields are again brought to the initial value to receive the beam from microtron. The entire process is completed in one second.



Synchrotron signals during acceleration. TR1A - Fast current transformer signal (13 mV = 1 mA), TR2A - PMT signal, TR3A - DCCT signal (1 V = 10 mA), TR4A - dipole ramp cycle.

Initially, the synchrotron was operated at the injection energy of 20 MeV. This was to facilitate the study of various beam parameters before acceleration. Once satisfactory results were obtained the beam acceleration trials were started. On September 26, 1995 the electrons were accelerated to 480 MeV and synchrotron light was observed. Initial observations were made using photo multiplier tube (PMT) mounted on synchrotron light monitor window and the current was measured by a DC current transformer. Finally, the PMT was replaced with a CCD camera. Synchrotron signals are shown in the figure. The distortion in the signal is due to the low frequency pickups from the ramp cycle. Efforts are in progress to increase the beam current of 1.8 mA further, to inject it into Indus-1.

Commissioning of microtron at Mangalore University

A 8/12 MeV microtron was designed and fabricated at CAT. It was installed and commissioned at Mangalore University on Sept 28, 1995. An electron beam of 8 MeV energy and 20 mA pulse current was achieved during commissioning. Dr R Chidambaram, Chairman, AEC handed over the microtron to Prof M I Savadati, Vice Chancellor, Mangalore University on Sept 29, 1995. On this occasion, an International conference on R&D using electron accelerators was organised by Mangalore University. This microtron will be used as a multi-institutional facility for interdisciplinary research and education purpose.

Dr R Chidambaram, Chairman and Secretary, Department of Atomic Energy , Shri S S Ramamurthi, Project Manager (Accel.) with the Microtron commissioning team from CAT at Mangalore University.

Cover: *The internal details of microtron. The RF cavity, beam extraction channel, field measuring probe and bottom pole of the magnet are visible in the photograph.*