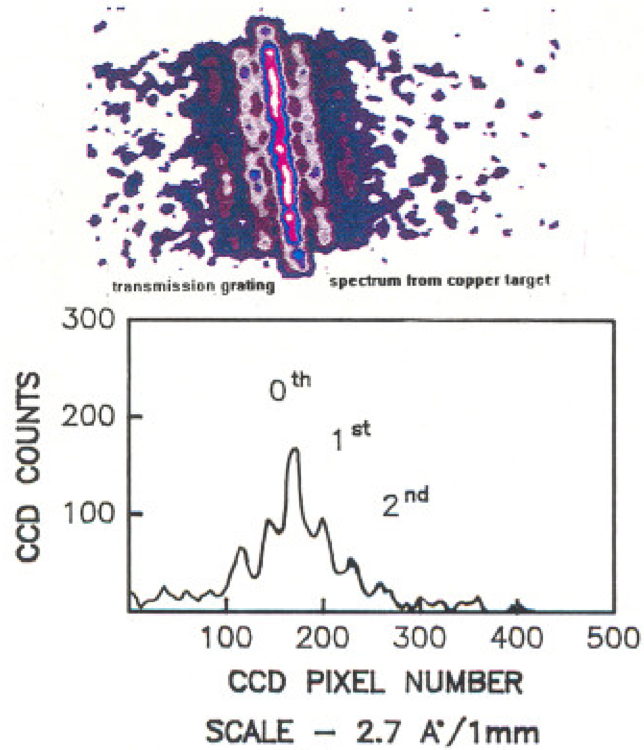


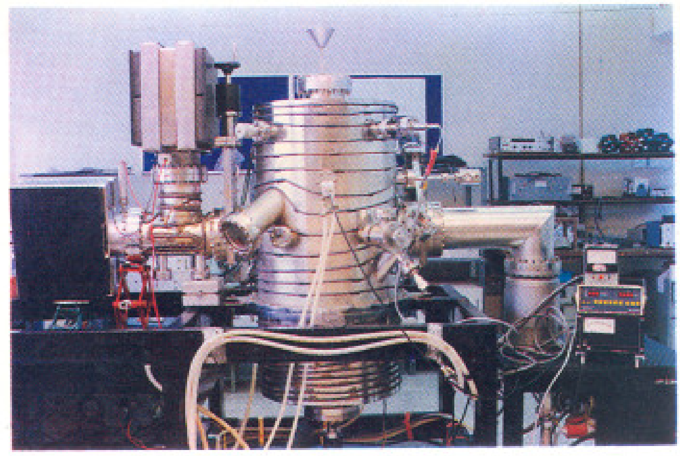
Fig. 3 Image and intensity profile of x-ray spectrum from copper plasma.

PROMISE Software. The spectrum shows clearly 1^{st} and 2^{nd} orders on both sides of the 0^{th} order.

ACCELERATOR PROGRAMME

Commissioning of booster synchrotron

An accelerated current of 9 mA at 450 MeV energy has now been achieved in the booster synchrotron. This increase in current from 1.8 mA (CAT Newsletter, July - December, 1995) was achieved by optimisation of RF parameters and steering of the beam orbit. The beam is steered in both horizontal and vertical planes using six horizontal steering magnets located on the six dipole magnets and five vertical steering magnets, installed separately. Now these steering magnets were operated in ramp mode. The RF parameters were optimised by detuning of cavity frequency with respect to revolution frequency and ramping of the RF voltage linearly from 1.5 kV (at injection energy) to 5 kV (at peak energy). Lower voltage at the injection energy reduces the losses due to synchrotron oscillations. Whereas at higher energy, high voltage is required to compensate for the synchrotron radiation losses. Earlier a constant voltage was applied throughout the ramping. Besides this, injection magnet parameters and other magnet parameters were further optimised. Beam extraction trials will start very soon.



Setup for electron beam deposition for X-ray multilayer mirrors

Electron beam deposition system for x-ray multilayer mirrors

Optical elements with multilayer coatings for XUV optics have wide application in many fields including synchrotron radiation instrumentation, plasma diagnostics, soft x-ray spectrometers and x-ray astronomy. These elements consist of stacks of thin film which are composed of materials with alternate high and low scattering power, and have periodicity in the range of 10 to 100 Å. These can be operated at higher angles of incidence. For developing such films an electron beam (e-b) evaporation system has been developed. In this, three e-b evaporation sources have been incorporated in an ultra high vacuum deposition chamber. This is evacuated by a turbomolecular pump and two sputter ion pumps. The film thickness and deposition rate is monitored using two quartz crystal monitors and a quadrupole mass analyzer. A substrate holder which can be cooled to liquid nitrogen temperature is also installed. A movable masking system has been mounted just below the substrate to deposit several kind of multilayers without venting the system.

Radiological safety in Indus-1 building

With the increase in beam current and energy during commissioning stage of booster synchrotron, radiation fields inside booster synchrotron hall have increased significantly. In view of the potential radiation hazards (Bremsstrahlung X-rays and neutrons) in Indus-1 building during operation of microtron and booster synchrotron, several steps have been taken for ensuring radiological safety of working personnel. The Indus-1 building has been divided into three zones based on their hazard potential:

(1) Normal areas, such as the entry lobby, main corridor etc. where persons have free access.

(2) Restricted entry areas (synchrotron radiation source hall, microtron control room) where monitoring