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TITLE: STATUS REPORT ON THE LOS ALAMOS NATIONAL LABORATORY  
ION BEAM FACILITY

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TITLE: STATUS REPORT ON THE LOS ALAMOS NATIONAL LABORATORY ION  
BEAM FACILITY

SUMMARY: The Ion Beam Facility operated for 6000 machine hours last year ranging in energy from 300 Kev to 24 Mev. Improvements include cryopumps replacing diffusion pumps, a rebuilding of the tandem chopper electronics and the vertical's corona charging system. Methane molecules were successfully accelerated by the vertical in quantities of hundreds of nanoamperes. Two replacement magnet power supplies on the tandem and a completely new capacitor shell regulator on the vertical are soon to be installed.

STATUS REPORT ON THE LOS ALAMOS NATIONAL LABORATORY ION BEAM FACILITY

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Los Alamos National Laboratory

The Los Alamos Ion Beam Facility has performed very well during the past year considering our contribution to the construction of Los Alamos Neutron Scattering Center (LANSCE). Maintenance and development have been kept at a bare minimum.

Projects completed this year include installation of more cryopumps, rebuilding of the high energy electrostatic chopper, and rebuilding of the vertical's corona charging needles.

An electron - bombardment ion source (1) and associated controller has been adapted to the terminal of the vertical Van de Graaff to provide positively charged methane ions for the accelerator mass spectrometry project being investigated in collaboration with group INC -

11. In preliminary shake down runs the accelerator has produced hundreds of nanoamperes of analyzed beams of  $\text{CH}_3^+$  and  $\text{CH}_4^+$  in approximately equal amounts. Included in this project was the development of a regulating system capable of operating with sub-femtoamp currents. This was accomplished with plastic scintillators and ratemeters.

For the purpose of radiation damage studies both accelerators have been asked to produce exceptionally low energy ions this year. The tandem has produced 500Kev protons and the vertical has produced 300Kev ions of  $\text{He}^+$ .

Since the old HVEC magnet power supplies are becoming more troublesome, two new supplies have been ordered from Danfysik. They are expected to be delivered early next month. A new cap shell regulator is being designed and built by Gamma High Voltage, Inc. This supply provides the "fast" regulation for the vertical. It's delivery is also expected early next month.

New projects for next year include a new general purpose tandem injector; a superbuncher (if funds are available); redesign the vertical's telemetry system; and design of terminal cryopump systems.

Our facility is now housing the construction of an antiproton trap which is part of a major laboratory program in collaboration with Rice and Texas A & M to obtain a measurement of antigravity. The experiment will be done in Europe but the development and testing of the apparatus will require both low energy p and H<sup>-</sup> ions as well as higher energy H<sup>-</sup> beams from the vertical.

Running statistics for fiscal year '85 are:

Tandem - 2944 hours

Vertical - 3071 hours

(1) Extranuclear Laboratories Inc.

Model #041-1