

DYNAMITRON TANDEM LABORATORIUM
REPORT OF OPERATION 10/2005 - 09/2006

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4 MV Tandem accelerator

During the last year the HV power supply of the Dynamitron was operating 5433 hours, delivering a total of 5108 hours beam for different applications including industry, nuclear physics, material research and ion beam analysis.

Even after more than 30 years of operation the machine is still in a very good condition. We had three tank openings for repairs (one of the terminal cryo pumps failed, two weeks later a cable in the control system of the same cryo pump was found to be loose and one broken corona ring) and one opening for checking the sealings of the tank.

The HV generator is based on vacuum tube and over the years it has become more and more difficult to find replacement parts. The last "new" tube has been installed in 01/2006. We have some "rebuilt" tubes in stock which have been successfully tested this year. Since the situation is expected to get even worse, we think of the possibility of replacing this part with an all-solid-state power supply.

In 04/2006 one of the biggest alterations of the last years has been made at the injector. The TorVIS injector has been installed after several months of testing. Shortly after installation the source failed due to an unknown reason but could be successfully repaired. The new system is performing very well and delivers currents of 6-8 $\mu\text{A He}^-$ and 100-150 $\mu\text{A H}^-$ without special preparation. Until now the source has operated for ~1100 hours (75% He, 25% H) with negligible maintenance compared to the old Duoplasmatron/Li system.

The heavy ion injector with the Cs sputter source was again used for a whole bunch of different ions, mostly H, C and Si. There have been two major problems with this source. In 06/2006 the 30 years old heat exchanger of the cooling system failed with a leak between primary and secondary circuit, contaminating the coolant (FC-77) with water. In 09/2006 the pump of the cooling system switched off and the cathode holder was damaged because the cooling interlock was not working properly. Both problems have been fixed within one day.

A new telemetry system based on National Instruments compactFieldPoint is currently developed and tested at the heavy ion injector.

500 kV accelerator

The radiation safety problems with this machine have finally been solved and operation even with heavy ions is possible without danger. The handling of the control system has been improved further and normal operation is expected to start at the beginning of the next year.

During the last year the accelerator has been used for xxx hours, most of the time with a Duoplasmatron source delivering a hydrogen beam for nuclear astrophysics.

100 kV accelerator

There has been no operation with the 100 kV accelerator in the last year because several power supplies were removed for the TorVIS test setup and have not been brought into operation due to lack of time.