

BROOKHAVEN NATIONAL LABORATORY TANDEM FACILITY

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Our MP7 accelerator has had about 70% utilization in the past year, clocking 6000 hours, of which approximately 10% was at terminal voltages between 14.75 and 16.25 MV. This pelletron system, installed in 1977, has logged 40,000 hours, and to date has broken five chains, three in the past four months. There are still two chains that have gone the total time.

The injector machine, MP6, with its three chains installed in 1980, has accumulated 18000 hours with no chain failures.

About six percent of the operating time in the past year was devoted to four-stage operation or accel-decel production of low energy highly stripped ions, for atomic physics experiments. This type of operation was improved by the addition of a remotely inserted gridded lens at the exit of the special last acceleration tube. Some examples of the beams we have produced are 2.5 MeV ^{35}Cl , Q16 10 na, 8 MeV ^{32}S , Q15 .5 na, 2.5 MeV ^{19}F , Q9 20 na.

We have acquired two General Ionex 860, Roy Middleton Mark VII sputter sources. One of these we have mounted on an ion pump, with integral focus lens, steerers and aperture, and dedicated it to ^{14}C use, for injection into MP7. To date, from June, we have used it for four runs totaling 32 8-hour shifts, and 116 μa hours, with a maximum injected beam of 2.5 μa .

The other 860 sputter source was used in a pulse mode to test for possible injection of the tandem accelerated heavy ion beam into BNL's AGS. The pulse length for these tests was 230 μsec , and ten pulses per second were injected into the accelerator. 170 μa pulses of ^{32}S negative ions were injected into MP7. The total instantaneous accelerator output current was 900 μa , of which 27 particle μa was in the most abundant charge state, Q-9. The operation of the accelerator was completely normal even though the instantaneous intensities were more than two orders of magnitude larger than conventional D.C. beams.

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The 860 source that gave us the high current pulsed beams is now being used for most runs with a few pellets, each loaded with many different elements. The only beams we do not get from it are helium and those requiring the addition of ammonia.

Our present caddock resistors mounted on capacitive plates are showing some changes in value, as well as a failure rate of about six per year. The new configurations, with caddock resistors mounted in a one-inch cylindrical shield with integral inductance, capacitance and annular spark gaps, have not changed at all, or failed in over a year. There are 20 of this type installed close to the terminal in MP7, and we plan to use them throughout when they are made.

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