

Planning and Coordination

MACHINE TIME EXECUTION

REPORT ( 2005-2-1.2 CYCLE)

Experimental Group	T-563	Reporter	Chuck Hailey
Scheduled Period and Shift	20	Para	Pi2

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SUMMARY OF EXECUTION AND RESULTS

Our beamtime was originally scheduled for 8 June to 15 June, 2005, but it was rescheduled for 15:00 on 9 June to 9:00 on 22 June. During this time we had 32 shifts of actual beamtime. The first three (3) days were spent tuning the beam for 1 GeV/c antiprotons and setting up our electronics and detector with both protons and antiprotons. The optimal magnet settings changed from that which we found in our first beamtime in 2004. This change was expected because the vacuum in the beamline, which was not functional in 2004, was repaired for our 2005 beamtime. The beam intensity ranged from 13 antiprotons per spill to more than 65/spill for a brief period of time, with an average of ~30/spill throughout our beamtime. We operated with protons for calibration and timing and to establish range curves for degraders. We took 144 total hours (18 equivalent shifts) of data using antiprotons on four (4) different targets – Al, CBr4, S, and CC14. We also ran for part of a shift with no target cell in order to assess the effects of target and ambient background, and we performed periodic gain calibration of the detector using a radioactive source. Detector count rates in the GAPS detector were comparable to pre-experiment predictions. Our detector and data-taking system operated as expected with no downtime. Preliminary analysis indicates that antiproton captures occurred in each target and produced X-ray emission from exotic atoms with the expected energy values.

EXECUTED MACHINE TIME, BEAM CONDITION, DOWN TIME etc.

We spent 2 shifts tuning the beam to conducting beam studies to optimize antiproton intensity and 7 shifts setting up electronics, performing preliminary calibration measurements on our detector system. Actual data was taken with antiproton beam over 19 shifts with nearly 4 million antiprotons recorded. Three equivalent shifts used for periodic gain calibration and beam normalization data. The beam condition was stable throughout our measurement and we experienced infrequent accelerator downtime.

COMMENTS

The experiment went smoothly and there is plenty of data to analyze.