Status report after exp. S395 (23 May-31 May 2011)

Expert team

Physics: Measure charge changing cross section of light neutron rich isotopes to extract charge radii, and to determine neutron skin thickness.

Beam: From 23rd May to 27th May: $^{22}Ne^{10+}$ @1000 MeV/u, i_max =2.0 10^{10} /spill, spill length =2-10 s. From 28th May to 31st May: $^{40}Ar^{18+}$ @1000 MeV/u, i_max = 3.0 10^{10} /spill, spill length =2-10 s.

Matter and detectors:

TA-Matter: SIS-window
SEETRAM
Target Be 6333 mg/cm2; TS2ET2HS adjusted by 5 mm (at 22.7 mm) to have beam centered according to current grids (adjustment done only from 15C setting onwards).

S1-Matter: several settings of S1 wedge (TS3ED2).

S2-Matter: SC21: Sci BC400, 0.485 cm (TS3ESA_S: 137 mm).
Disk (TS3ED7DP) and several settings of S2 wedge (TS3ED7V).
TPC23, High-rate capable TPC22*, TPC24.
Finger scintillator (0.1 mm).

S4-Matter: SC41 (Sci BC400, 0.3 cm), TPC41, Music, TPC21, veto Scintilllator
reaction target, Music, TPC42, SC42 (Sci BC400, 0.3 cm)

reaction target drive positions (HFSET4):
empty: 179.6 mm
37.23 mm polyethylene: 229.7 mm
21.74 mm C: 279.6 mm
13.69 mm C: 329.6 mm
5.7 mm Pb: 379.6 mm

veto scintillator: Sci BC400 0.3 cm, with 11.x4. cm hole in the middle.

* *'High-rate' TPC has one additional Mylar foil compared to standard TPCs, and was put in the beamline only for detector development work by Bratislava group.*

Voltage settings:

Detector	HV setting
TPC21A	1120 V
TPC21	2400V
TPC22A	1080 V
TPC22	1500V
TPC23A	1150 V

TPC23	2400V
TPC24A	1130 V
TPC24	2900V
TPC41A	1150 V
TPC41	2400V
TPC42A	1140V
TPC42	2400 V

For the second part of the experiment (40Ar primary beam) all TPC anode voltages decreased temporary to 1000 V.

Detector	HV setting
SC01	1400V
SC21L	2700V
SC21R	2300V
SC41L	2700V
SC41R	2150V
vetoL	1800V
vetoR	1800V
SC42L	1900 V
SC42R	2000 V

Detector	HV setting
MUSIC41C	6000V
MUSIC42C	6000V

Fragments settings: each setting was run for at least a C, polyethylene, and empty reaction target at S4.

- For ^{22}Ne primary beam: ^{10}Be, ^{14}B, ^{15}B, ^{17}B, ^{12}C, and ^{19}C.
- For ^{40}Ar primary beam: ^{9}Be, ^{8}B, ^{13}B, ^{14}C, ^{15}C, ^{16}C, ^{18}C, ^{19}C, ^{16}O, ^{18}O, ^{20}O, ^{22}O, ^{23}O, and ^{24}O.

Technical issues:

- MUSIC41 could only be biased up to -6 kV, because of discharges for higher voltages. Resolution of its first two anodes was a bit worse (dE/E ~ 7%) than for the remaining six anodes (dE/E ~ 5%).
- In some fragment settings we reached the limit of FRS magnetic rigidity, in particular for 17B we had to lower the primary beam energy to 22Ne@ 937 MeV/u to be bellow 18Tm at the FRS. Because of large magnetic rigidity the power supplies for the FRS dipoles were overheating, and we had to add a few strong fans to cool them down.
- For some settings (mainly with A/Z=3) the large dead-time of the DAQ was a limiting factor. For those an additional condition was used in the trigger to discriminate events with low signal amplitude in Sc41R (the intense light contaminants had x(S4)<0), and this kept the DAQ live-time at a level of ~80%.
- Due to high energy of the secondary beam fragments, the S2 slits were not thick enough to stop the lighter contaminants (H to Li would punch through them), so the only effective way to reduce the total rate at S2 was with the S1 slits.