

Beam Strategy Meeting

Monday, December 3, 2012, 12:00-13:30

Attending:

F. Ames, P. Bricault, J. Dilling, G. Hackman, R. Kruecken (chair), P. Kunz, J. Lassen, L. Merminga, A. Mjos, C. Morton, Ch. Ruiz, J. Wong

Excused:

J. Behr

Minutes:

1. Target schedule for 2013

The target schedule for 2013 was discussed considering

- Beam development priorities
- Backlog of high priority experiments for different targets
- Strategic consideration for the ISAC program
- Availability of target modules and ion-sources

In particular the following aspects were considered:

The development of the RFQ-LIS ion-source for suppression of surface ionized species is progressing well and the source can be commissioned. Offline tests are showing promising results. Due to the fact that the key expert will depart from TRIUMF in the summer a commissioning of the source as early as possible in the year is desirable. SiC or Ta have been discussed as possible target materials. SiC would enable yield measurements of light Al and Mg isotopes which are usually contaminated by Na. Ta would enable tests of rare earth isotopes. A low-mass target material has advantages as not too many contaminations are expected and the source performance can be better assessed. SiC was chosen and the SiC/LIS-RFQ target will run first as a development target.

It was proposed to run a new neutron-converter target with an annular UC target, backward of a Ta or W converter rod. This would avoid that the UC is hit by scattered protons and optimizes the solid angle covered by UC. This should allow the production of pure fission fragment beams and since no alpha emitters are produced, higher primary beam intensities may be possible, increasing yields for neutron-rich isotopes.

This project would be carried out together with the ISOLDE target group, which would provide the target assembly. TRIUMF would provide the heat shields as well as the UC disks as well. As a development target this should run only for a short run and thus would ideally be scheduled right after the mini-shutdown in the fall.

With the two development targets above no further pure development target would be scheduled. Thus the development of ^{18}F beams from a SiC/FEBIAD target (w/o CTL but w/ Al inserted for ALF production) would be postponed to 2013. That would be acceptable if significant progress can be made on the high priority beams for Nuclear Astrophysics, ^{18}Ne and ^7Be . For ^7Be an off-line run from the ISAC target station was discussed. Further discussion on the viability of this approach compared to an online production is needed.

For ^{18}Ne a SiC/FEBIAD-CTL is needed, which is planned for this development and could be used to satisfy the demand for high-priority experiments (from the point of view of the EEC as well as the involved collaborations). Examples are the delivery of ^{14}O for the CKM program (TITAN, 8pi/GPS) and ^{15}O for TIGRESS. Oxygen beams are extracted as CO molecules. The FEBIAD-CTL ion source is currently under construction and can be available for the 4th target in 2013.

The largest backlog in SAP RIB high-priority shifts for target/ion-source combinations is for Ta/SIS-LIS (174) and UC/SIS-LIS (138). In addition Ta is ideal for the production than ^8Li for betaNMR. While Nb/SIS is an alternative production target for betaNMR, TiC has proven to produce three orders of magnitude less ^8Li than a Ta target. Since there is little backlog for Nb/SIS it was decided to run three Ta/SIS-LIS targets.

In consideration of the fact that the 8pi will be in its last year of operation and it may take several years to tune GRIFFIN to the same precision for the CKM program, the 10C decay experiment, which was approved by the SAP-EEC in November should be run 2013. Thus a NiO target should be scheduled, which also will enable TITAN and IRIS proposals, which have been waiting for this beam development.

A big driver for the development of the RFQ-LIS was the ^{221}At decay study with the 8pi, which is essential to establish if a RnEDM experiment is feasible. The RFQ-LIS will suppress the large Fr contamination that has been made this study impossible so far. Thus, if the RFQ-LIS commissioning at the beginning of the schedule is successful, a UC/RFQ-LIS target will be scheduled for the low-current phase at the end of the year.

Out of these discussions the preliminary target sequence below has been decided. This sequence will be communicated to the users in the call for beam requests that will go out before Dec. 15.

For 2014 the highest priority target developments would be the SiC+Al/FEBIAD source for ^{18}F production as well as a metallic U/Ta target for development of Ca,Sc beams.

	Tgt	Ion-source	TM	Example beams	Examples of possible experiments	Comments / Questions
1	SiC	SIS/LIS-RFQ	TM4	^{25}Al , $^{20,23}\text{Mg}$	RFQ commissioning	RFQ-LIS R&D
2	Ta	SIS	TM1	^{11}Be , $^{9,11}\text{Li}$, ^8Li	TIGRESS, IRIS, bNMR, TUDA	No accelerated beams heavier than A=11
3	Ta	SIS/LIS	TM4	^{11}Be , $^{9,11}\text{Li}$, other	TIGRESS, IRIS, TUDA, bNMR	
4	UC	SIS/LIS	TM1	Mg, Sr, Fr	8pi, TIGRESS, FrPNC	
5	SiC	FEBIAD-CTL	TM4	^{18}Ne , ^{14}O , ^{15}O	DRAGON, TUDA, 8pi, TIGRESS	18F, 18Ne yields
Mini Shutdown						
6	nUC	SIS	TM3		8pi, TITAN (standby)	Neutron converter R&D
7	Ta	SIS/LIS	TM4	^{11}Be , $^{9,11}\text{Li}$, other	TIGRESS, IRIS, TUDA, bNMR	
8	NiO	FEBIAD	TM3	^{10}C	8pi/GPS, IRIS, TITAN	
9	UC	SIS/LIS-RFQ	TM4	^{221}At , Ac, Cd	8pi, TITAN	

2. Target developments arising from SAP-EEC meeting in November 2013:

LOI S1397 is asking for beam development of 221-224At as well as 217-232Ac studies by the TRILIS group. These LOI will be added to the beam development plan for UC target with RFQ-LIS.

December 13, 2012

Reiner Kruecken