Minutes of the TITAN Meeting

Held on the 17th of September, 2009

Present: Thomas Brunner, Paul Delheij, Stephan Ettenauer, Aaron Gallant, Alain Lapierre, Ernesto Mane, Matt Pearson, and Vanessa Simon

Charge breeding: K-beamtime and upcoming(?) Rb-beamtime

x) Alain made some calculations concerning the efficiency for K and Rb charge breeding:

EBIT extraction efficiency onto MCP0				
Calculated efficiency	Injection eff.	100%	**Single-ion measurement**	
	Capture eff.	100%	**Single-ion measurement**	
	Total length of extracted bunches	25	mus	
	Extraction switching time	0.5	mus	
	Direct EBIT extraction eff.	**2%**		
	Trans. eff. *singly charged ions*	**50%**	**Single-ion measurement**	
	TOTAL EFF.	**1.0%**	for all charge states	
	Charge state distribution	20%		
	TOTAL EFF.	**0.20%**	per charge state	
Observed efficiency	Detected number counts of 44K4+	8.29	per shots	
	MCP0 detection eff.	25%		
	Number of ions reaching MCP0	**33.16**	per shots	
	Yield of 44K (FC3)	2.E+08	per sec (~37 pA)	
	RFQ efficiency per sec	8%	at 10 Hz	
	RFQ efficiency per shot	0.8%		
	Ions per shot out of RFQ	**1.6E+06**	per shots ???	
	TOTAL EFF.	**0.002%**		
74Rb transport efficiency onto MCP0				
	74Rb yield (FC3)	**1.E+04**	**per sec**	
	RFQ efficiency per shot	1.5%		
	Ions per shot out of RFQ	**1.5E+02**	**per shots**	
	Ions reaching from calculated eff.	**0.3**	**per shots**	
	Ions reaching from observed eff.	**0.0031**	**per shots**	
	Detected no. of counts is less by	**25%**		
***Space charge limit of the EBIT: Brillouin limit: ~1E7 ions @ 4T (and with no electron beam)**				
***Energy spread: 40 eV seems to be within the bender acceptance**				
***Sensitive to the EBITBL quadrupole triplet: switch the triplet upon injection/extraction**				
***Extraction tune is sensitive to all the quadrupole triplets.**				

x) Note also that the efficiency from MCP0 to MPET is about 20 % when the beam is coming from the EBIT.
x) Main reason for better efficiency than in the beginning of the year is mainly due to better tuning.
x) Extraction tune is different for injected beam and ions produced in the EBIT.
x) Rb from the K-source is probably not enough to test charge breeding.

Laser spectroscopy beamtime:
Matt and Ernesto plan:
x) Test the reverse extraction. This can be done with K, too, and will be done within the next days.
x) Initial tests with Li. This requires changing back to the Li-source. This can be done as soon as Max and/or Mel are back next week. Then, measurements Li^6 vs Li^7 can be performed.
x) MCPs:
MCP in bend after RFQ is in place.
second MCP: Alain will give back the MCP to Matt.
x) It will be required to know the bias voltage of the RFQ in the volt-range. Matt will check how accurate the epics read-back value is.
x) One week before the beamtime, we will put in the Rb source.

Ernesto will need some start up information about the RFQ.

Ernesto and Matt think that they will need to work with the RFQ about 1/3 of the time until the beamtime. The rest will be available for TITAN tests.

EBIT test ion source:
Alain got all the material. The test ion source should be installed within the next weeks.

Switchyard:
Additional power supplies will be installed and integrated in the epics control. This will be done within the next 2 weeks.