Experiment Proposal: AR_2012_No6

Title	Author/Spokesperson
Evaluation of FCT and RT signal readout	**A. Reiter (1431)** **H. Reeg (2447)**

Summary & Aim

- These tests are part of the **R&D DAQ for FAIR**
- Short summary: Comparison of FCT and RT signal quality with different candidate electronics realisations:
  - RT charge obtained via peak detector (single value)
  - RT charge obtained via signal trace and following analysis
  - FCT charge obtained via integration of analogue signal
- **Data necessary to define RT/FCT application and DAQ layout for FAIR**
- Fast extraction from SIS18 towards HTP beam line
- Pilot test may be carried out parallel to other HTP measurements
- Requested beam time: 1 shift

Machine parameters

Machine	SIS18
Mode	Main experiment / parasitic mode / B-exp
Exp. area	HTP
Ion species	any
Beam energy	any
Spill length	Fast extraction
Particle number	$10^5 – 10^9$
Repetition rate	0.1 Hz
Shifts	1
Beam Time Period	Autumn 2012 and later
Health & Safety	No issues

Experiment procedure

Several data sets are taken for a variety of particle numbers starting with the lower limit, i. e. the minimum detectable particle number. Data sets for three energies should be taken.

Compare repeatability (precision) of RT, FCT

Investigate linearity of SEM foil in air against RT and FCT readings

FCT & RT: Dependency of signal on position! Use SEM grid to monitor beam position and spot size. Readout of SEM foil which is independent of position (if fully hit by beam); Use dipole and quads to change hor. position or beam spot size.

Experiment Setup	
Exp. area	HTP
Description of setup	RT and FCT mounted as detector combination in HTP beam line
	SEM-IC in air
	3 coaxial signals to AP container for FCT / RT oscillat. / RT peak det.
	2 multi-core cable (Sub-D 25-pin) for FCT and Air-IC attenuator control
	1 coaxial signal for signal of SEM-IC in air (no HV)
Duration of setup	Permanent installation, non-interceptive
DAQ & Electronics	FESA DAQ (FAIR development) or fast oscilloscope (for tests only)
Software	Java GUI
Trigger	Synchrotron extraction? Delay for DAQ to be defined.

Experiment Preparation / Required support		
Estimated amount of time, manpower and equipment		
Estimates or simulations	1 day	Calculation of signal (AR)
Mech. Workshop		Not required
Beam Line Installation		Transformer combination (RT/FCT) installed at HTP
Electronics & DAQ		2 connector boxes (1-ch. switch. att.+amp.) by R. Johänntges
		FCT and SEM-IC pre-amplifier electronics via connector boxes, remote-control for electronics
		RT: 2x signal output of osc. trace (GSI control system + FESA DAQ), 1 output of peak-detector voltage (FESA DAQ)
Control System Integration		FESA class and GUI (H. Bräuning, O. Chorniy)
On-site Tests		H. Bräuning, A. Reiter, O. Chorniy, H. Reeg
Modification of exp. area		Not required
Dismantling of setup		Permanent installation
Remarks & Comments		

- Control of RT via Nodal
- Logging of RT data

Hallo Lars,

ich habe ein NODAL-Prg. "HTPDT1_LOG" erzeugt. Es schreibt Dateien "htpdt1_chg.txt;x" nach US11$ROOT:[BOZYK.HTP].
Das Unterverzeichnis HTP musst Du vor dem ersten Programmstart noch anlegen, ich glaube mit create/directory [name] o. ä.

Gruß Hannes