Experiment Proposal: AR_2012_No5

Title	Author/Spokesperson
Test of QFW electronics with Ionisation Chamber and slow extraction	**A. Reiter (1431)** **M. Witthaus (2447)**

Summary & Aim

- **This test is part of the R&D for FAIR: QFW electronics performance with large capacitive input load (long analogue cables between detector and QFW electronics)**
- **Feasibility of QFW application in high-radiation environment at pBar Separator**
- Test can be carried out in parallel to other experiments
- SIS18 beam & slow extraction.
- Requested beam time: 1 shift
- Recorded data: Chamber signals as function of particle number, high-voltage and QFW parameters (e. g. cable length)

Machine parameters

Machine	SIS18, slow extraction
Mode	B-exp
Exp. area	HTP
Ion species	Any
Beam energy	300 – 800 MeV/u, in principle any
Spill length	200 ms – 1 s
Particle number	10^4 – 10^9 per spill
Repetition rate	~ 0.1 Hz or higher
Shifts	1 shift
Beam Time Period	Any machine experiment (B-exp) in March 2012
Health & Safety	No concerns

Experiment procedure

After setup of beam at end of HTP line, the following series of data are taken:

- Ionisation chamber response as function of particle number (one beam energy)
- Reference detector at HTP: HTPDI1I, HTPDI1S
- Test of QFW electronics

Experiment Setup		
Exp. area	HTP, in front of beam dump	
Description of setup	• SEM-type ionisation chamber (IC) in air (+ LHC-type BLMI) • Detector position behind exit of last diagnostics chamber • Distance to beam dump: ~50-100 cm	
Duration of setup	• Mounted only during beam time	
DAQ & Electronics **Software**	Long cable to Atomic Physics container, QFW & Ablass system, digital oscilloscope Standard operating software	
Trigger	Acquire full spill	
Experiment Preparation / Required support **Estimated amount of time, manpower and equipment**		
Estimates or simulations	4 h	Signal estimate A. Reiter
Mech. Workshop		Not required
Beam Line Installation	3 h	H. Graf (A. Reiter): Re-mount SEM on pneumatic actuator, rough alignment
Electronics & DAQ	2 days	Setup of electronics in DAQ container and tests (A. Reiter / M. Witthaus)
Control System Integration	done	Use existing detectors in Control System, e. g. IC: TST…74I, etc.
On-site tests		**Need test VACC for Ablass readout**
Modification of exp. area	No	Pneumatic actuator in place at HTP 1x RG214 cable to AP container from patch panel
Dismantling of setup	2 h	Dismount setup, store detector at HTP (A. Reiter)
Remarks & Comments		
Feed current to QFW in AP container, then forward pulses to ELR, refresh signals, readout in Ablass system. **Max. rate of Walter scalers (QFW: 40 MHz)???**		

OPEN ISSUES & QUESTIONS
• **Kennung an I-Kammern BLMI anbringen** • **Reservierung Analogkabel in HTP für Test** • **Definition der HV-Kanäle (über AP oder ELR)** • **Module für AP: Diskriminator (Länge Puls einstellbar), evtl. Logikmodule** • **Signale von AP nach ELR: Test mit Pulser. Was ist mit Kabel in Feld 2** • **Aufbau QFW in AP: Bedienung der Triggerkisten in Rack 1?????** • **QFW: Signale in LVDL-Standard – Anpassung Signalpegel ??????** • **Verbindung PC in AP zu Ablass via X-Win32???** • **Module für ELR: Diskriminator und Logikmodule (ggf. 2 Kanäle HTPDI5I/S nutzen)** • **Kanäle in Ablass definieren/belegen! (Änderungen P. Kainberger und Tests AR+HR abwarten)** • **Maximale Rate der Ablass Scaler??? Test mit Pulser und VACC 2 möglich???**