

ELENA Beam Transfer Workpackage

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ELENA TL Workshop, 25-Jan-12

Outline

- Experiments' wishes
- Beam Transfer WP and interfaces to other WPs
- Collaborations
- Timeline

Experiments' wishes

- ALPHA (Eoin Butler):
 - Important is number of antiprotons on target, not only high number but also stable
 - Beamsizes at target: 0.5 mm in diameter
 - Shot-to-shot reproducibility of few tens of microns over 8 hours
 - For longitudinal capture bunches of maximum 300 ns length
 - Tunability of transverse position required for long term drifts
- ASACUSA (Masaki Hori):
 - Beam spot of 5 mm
 - No shot-to-shot changes required

Beam Transfer WP and Interfaces to other WPs

SCOPE	WHAT	WHO/INTERFACE
Coordination		Wolfgang Bartmann
<i>Deliverables</i>	<i>Manpower</i>	
	<i>Budget</i>	
	<i>Schedule</i>	
	<i>Collaboration</i>	
Optics		Wolfgang Bartmann, ABT-BTP
	Requirements and constraints	
	Injection, Extraction calculations	
	Geometry of lines	
	Optics calculations	
	Switch specification	
	Sensitivity to time varying magnetic fields	
	Trajectory correction	
	Aperture specification	
<i>Deliverables</i>		
	<i>Frozen optics design</i>	
	<i>HW specification</i>	

SCOPE	WHAT	WHO/INTERFACE to other WP
Magnets		Thomas Zickler, Daniel Schoerling
	AD to ELENA TL magnets covered in Magnet WP	
	Recuperation, refurbishment	
	Design (shielding)	
	Tendering	
	Fabrication	
	Preparation (incl vacuum chambers)	
	Magnet surveillance, controls and expert applications	
Injection/ejection kicker		Luc Sermeus
	Recuperation, refurbishment	
	Possible shorter magnetic kicker	
	Possible electrostatic kicker	
	Possible fast pulsed switch	
Injection/ejection septa		Jan Borburgh
	Recuperation, refurbishment	
	Septum spare	
	Possible electrostatic septum	
	Possible fast pulsed switch	
<i>Deliverables</i>		
	<i>Magnets ready for installation</i>	
	<i>Expert applications ready</i>	
	<i>Related drawings released</i>	

SCOPE	WHAT	WHO/INTERFACE
Electrostatic lenses/deflectors		Daniel Barna, Masaki Hori
	Design (shielding)	
	Prototyping	
	Fabrication	
	Preparation (incl vacuum chambers)	
	Surveillance and controls and expert applications	
<i>Deliverables</i>		
	<i>HW ready for installation</i>	
	<i>Expert applications ready</i>	
	<i>Related drawings released</i>	
Power converters		David Nisbet
	Recuperation	
	Prototyping	
	Design	
	Tendering	
	Fabrication	
	Preparation for installation (Cabling, shielding)	
	Controls and expert applications	
<i>Deliverables</i>		
	<i>HW ready for installation</i>	
	<i>Expert applications ready</i>	
	<i>Related drawings released</i>	

SCOPE	WHAT	WHO/INTERFACE
Beam instrumentation		Gerard Tranquille, Masaki Hori + University of Tokyo
	Profile monitors, Cherenkov counters	
	Beam transformer, Aluminium activation	
	Recuperation of existing equipment	
	Design	
	Fabrication	
	Preparation for installation	
	Controls and expert applications	
<i>Deliverables</i>		
	<i>HW ready for installation</i>	
	<i>Expert applications ready</i>	
	<i>Related drawings released</i>	
Vacuum		Roberto Kersevan
	Refurbishment of existing chambers	
	Chamber design (EM shielding)	
	Gauges	
	Pumping	
	Controls and expert application	
<i>Deliverables</i>		
	<i>Vacuum chambers for bends/quads delivered for bends/quads assembly</i>	
	<i>Chambers (outside bends/quads) ready for installation</i>	
	<i>Expert applications ready</i>	
	<i>Related drawings released</i>	

SCOPE	WHAT	WHO/INTERFACE
Controls		Matthieu Cattin
<i>Deliverables</i>		
	<i>HW (servers, memory, consoles,...)</i>	
	<i>SW (logging, applications,...)</i>	
Interlocks		Bruno Puccio
Design studies/drawings		Diego Perini
<i>Deliverables</i>		
	<i>All equipment drawings in DB</i>	
	<i>All beamline drawings in DB</i>	
Transport		Serge Pelletier
RP		Joachim Vollaire
	Monitoring	
Cables		?
	Check existing cables	
	Recuperation	
	Power cable order	
	Controls cable order	
	Drawings and integration	
	Cable installation	
<i>Deliverables</i>		
	<i>Cables ready for installation</i>	
	<i>Related drawings released</i>	

SCOPE	WHAT	WHO/INTERFACE
General safety		Horst Breuker
	Access, smoke alarm,...	
Survey		Tobias Dobers
Beam stopper	check if needed	?
Installation		Nicolas Gilbert
	Dismantling	
	Pre-installation cleaning	
	Safety equipment installation	
	Cooling/ventilation installation	
	Cable and EL installation	
	Magnet installation	
	BI installation	
	Vacuum system installation	
	Post-installation cleaning	
Beam transfer commissioning		Wolfgang Bartmann, ABT, Tommy Eriksson
	Commissioning procedure	
Operation		Tommy Eriksson
	Applications	
	SW	
	Operation Procedures	
	Interface Experiments-TLs	

Additional time constraints

- TL(s) between commissioning source and ELENA
 - should be ready for ELENA ring commissioning
 - installation during 2014 together with ring installation
- TL for Gbar decelerator test stand with antiprotons
 - as soon as antiprotons available from ELENA
 - installation during ELENA commissioning?

Collaboration

- Proposal from Masaki Hori for electrostatic devices and profile monitors
 - Mechanical design of electrostatic beamline elements
 - Construction of electrostatic beamline elements
 - Test of electrostatic beamline elements with 100 keV beam, and vacuum leak tests etc.
 - Mechanical design of beam profile monitors
 - Construction of beam profile monitors
 - Test of beam profile monitors with 100 keV beams.
 - Control software writing for beam profile monitors compatible with CERN PS control system
 - Design of most types of VME64x control electronics according to the CERN PS control systems standard
 - FPGA based software and hardware design work
- More than 7 MY equivalent
- Already ongoing:
 - Advanced prototype for profile monitor
 - New quadrupole triplet for 130 keV antiprotons in ASACUSA beam line with the plan of having beam in 2012

Potential further collaboration

- Development project for SIGMAPHI with partial support from the Bretagne Council
 - Bretagne Council could cover 45% (max 300k€) for design, R&D and realization of a prototype (further devices of same type NOT included)
 - Fast pulsed electrostatic device for extraction or switchyard identified as possible candidate
 - Technical description will be provided by ABT

Summary

- Experiments' wishes need to be completed
- WP structure and interfaces to other workpackages need possibly refinement
- Time constraints are challenging – in particular in view of earlier installation for source and Gbar test stand
- Collaboration for electrostatic devices and beam profile monitor ongoing
- Further collaboration to be discussed