

HiRadMat – A proton test facility with Transnational Access

Adrian Fabich



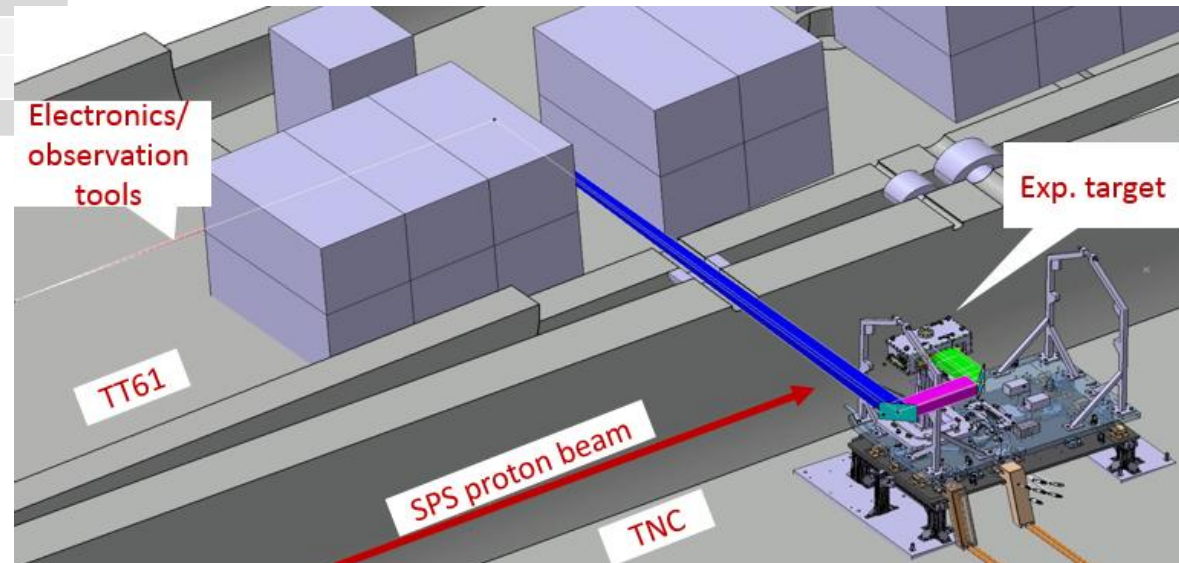
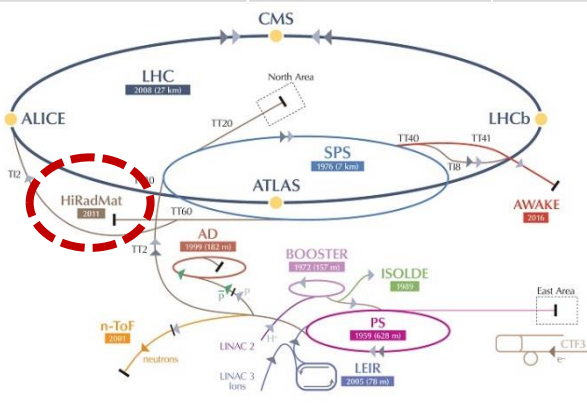
EuCARD-2 is co-funded by the partners and the European Commission under Capacities 7th Framework Programme, Grant Agreement 312453

- Dedicated facility for studying the impact of intense pulsed beams on materials:**

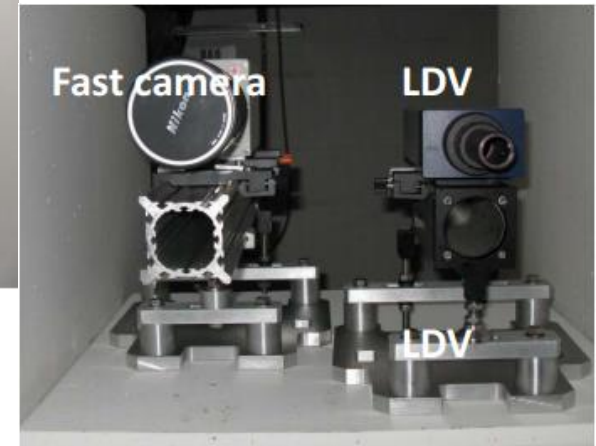
material damage, material vaporization, thermal management, radiation damage, thermal shock, beam induced pressure waves

<http://cern.ch/hiradmat>

	Protons	Heavy ions (Pb ⁸²⁺)
Beam energy	440 GeV	173 GeV/u
Bunches/pulse (max)	288	52
Pulse intensity (max)	5 · 10 ¹³	4 · 10 ⁹
Bunch spacing	25, 50, 75 or 150 ns	100 ns
Pulse length (max)	7.2 μs	5.2 μs
Beam spot	variable around 1 mm ²	
Pulse energy (max)	3.4 MJ	21 kJ



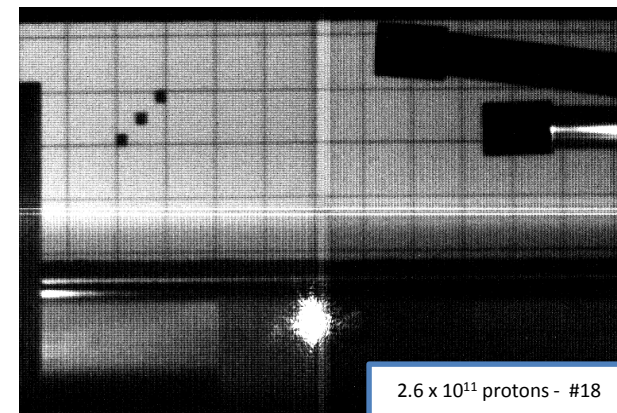
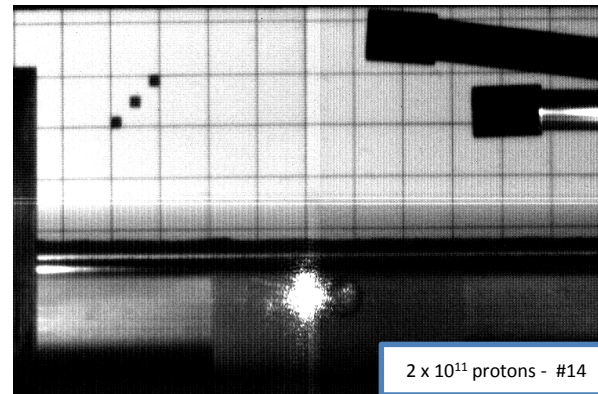
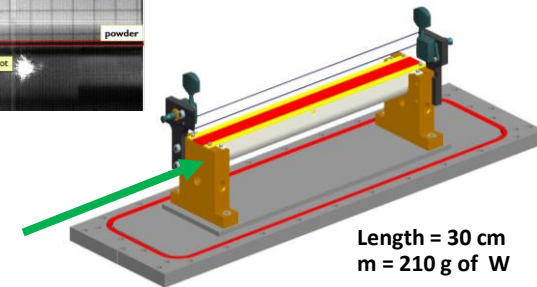
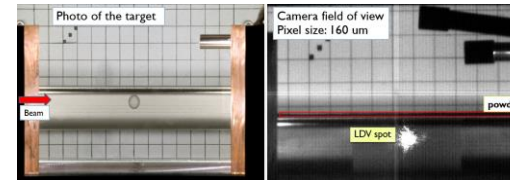
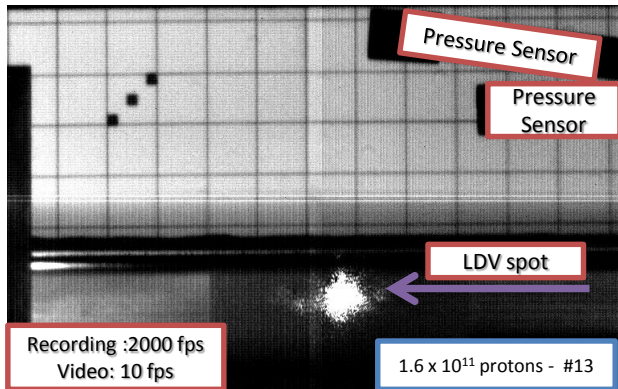
With CERN support to visiting teams



- ▶ Assisting during preparation, installation, operation and follow-up
- ▶ Advising in safety matters and radiation-protection

R&D for a high power proton target

C. Densham, N. Charitonidis et al.

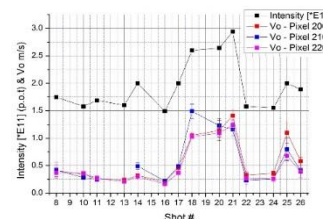


100 Sv
400 Sv
~ 1kSv
Beam

Instrumentation :

- High speed Camera
- Laser Doppler Vibrometer

Both placed behind a concrete bunker @ a distance of ~ 35 m away from the target



of Tungsten beads (100 microns)

Validation of collimator materials

Engineering Department

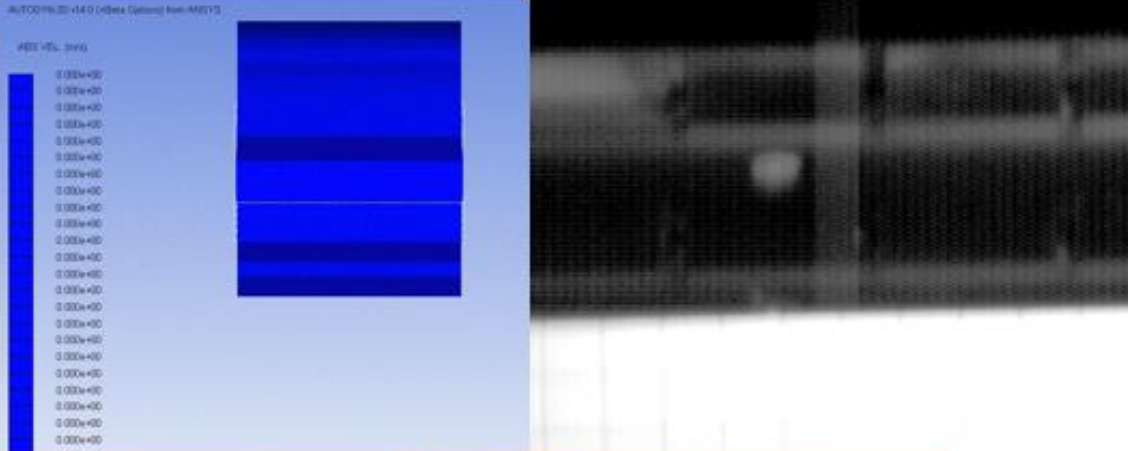


High Intensity Tests (Type 2)



Inernet : comparison between simulation and experiment

Beam

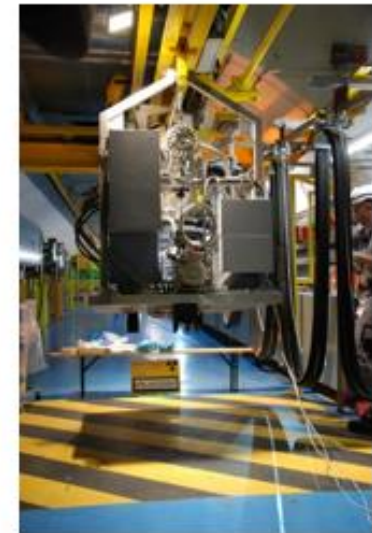
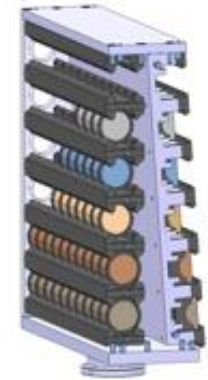


Case	Bunches	p/bunch	Total Intensity	Beam Sigma	Specimen Slot	Velocity
Simulation	60	1.5e11	9.0e12 p	2.5 mm	9	316 m/s
Experiment	72	1.26e11	9.05e12 p	1.9 mm	8 (partly 9)	~275 m/s

14th March 2013

A. Bertarelli, M. Guinchard - EN-MME

EuCARD 47



Courtesy: A. Bertarelli, M. Guinchard

Validation of collimator materials

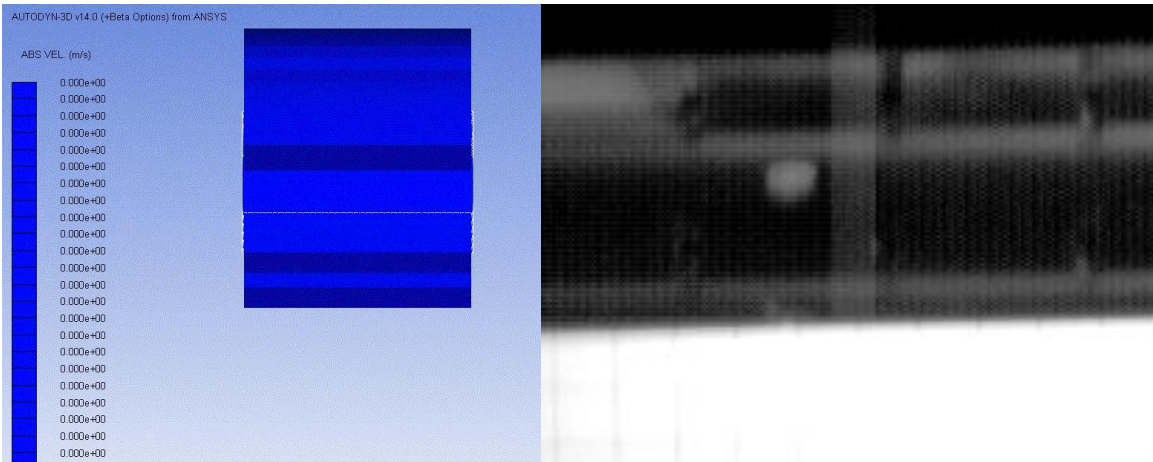


High Intensity Tests (Type 2)



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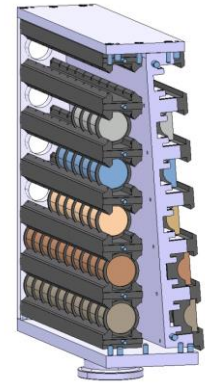
Engineering Department EN



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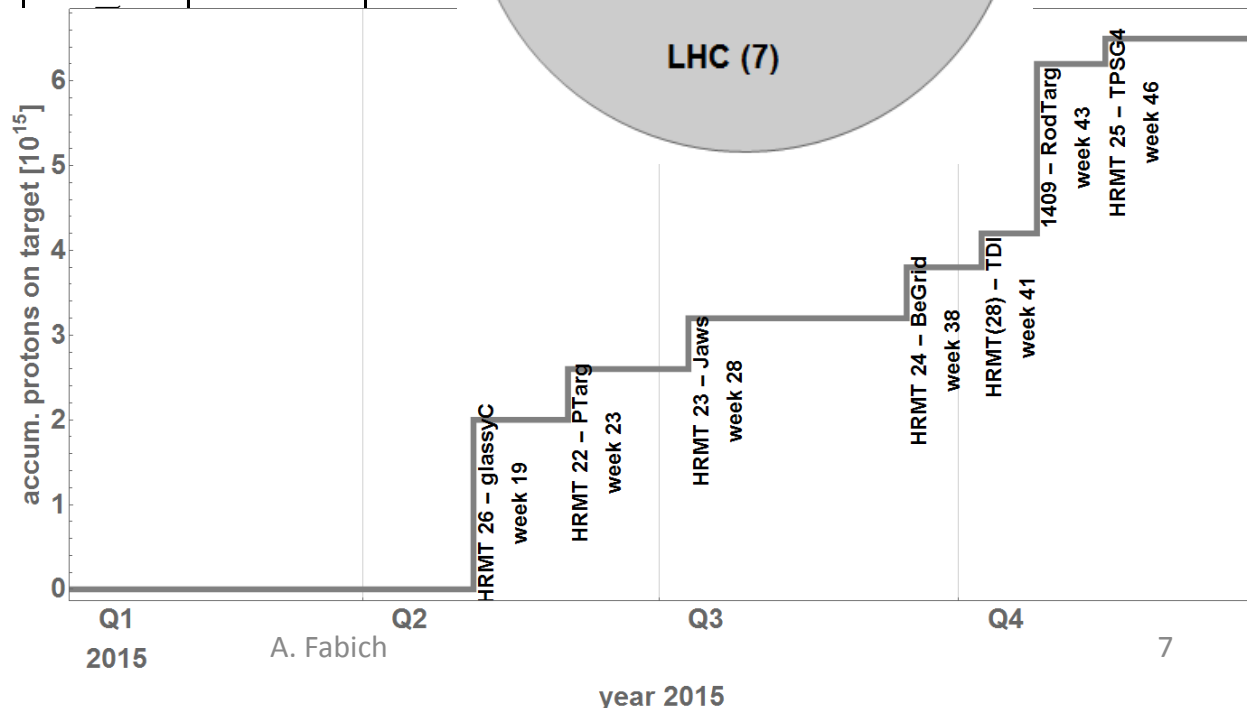
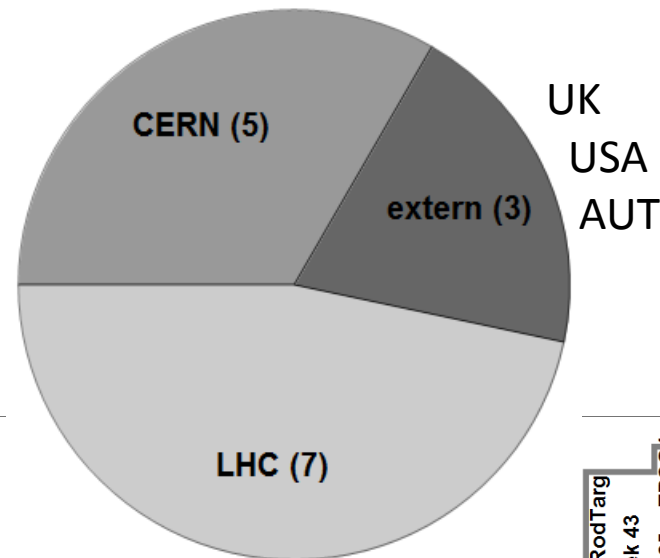


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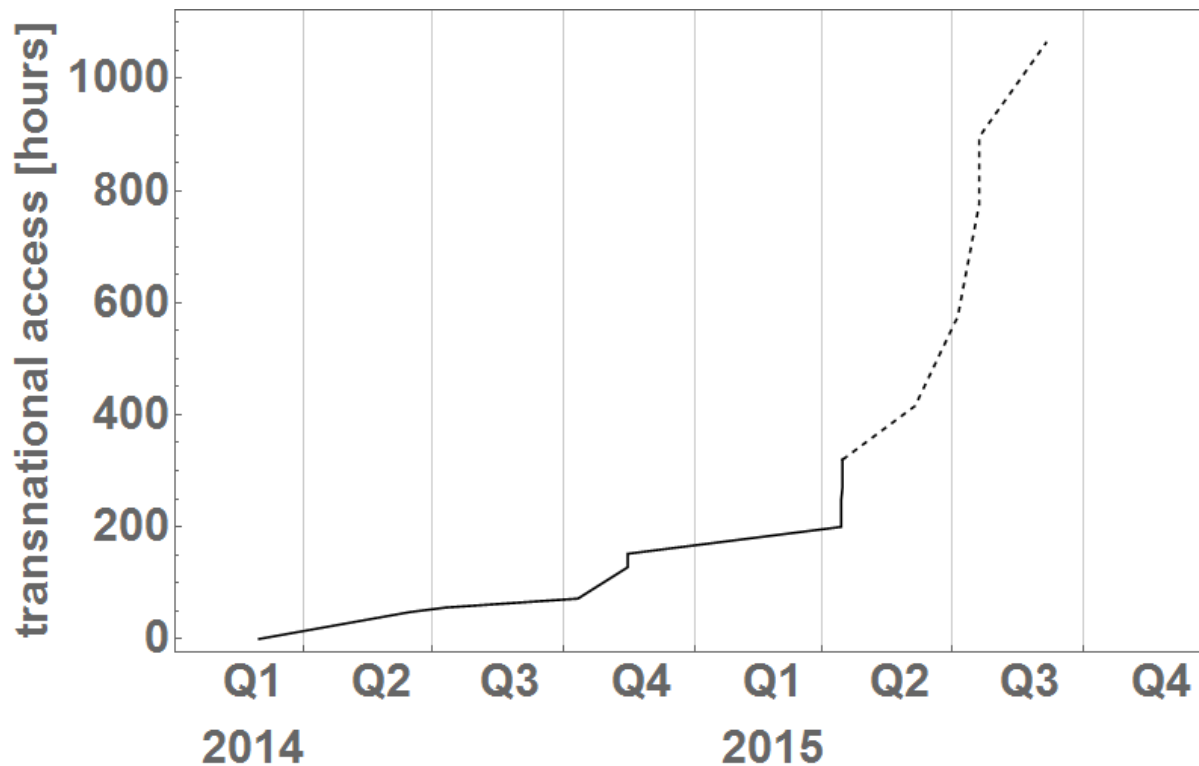
Exp. proposals 2015/2016

Context of HRMT 2015/16

proposal #	name	index	HRM-SB	HRM-TB	proposed beam time
1401	BLM2	19	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Jan-15
1402	TPSG4	25	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Aug-15
1403	GlassyC		<input checked="" type="checkbox"/>	15.12	May-15
1404	dBm	17	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Dec-14
1405	BeGrid	24	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Nov-15
1406	SextSC				Jan-16
1407	Jaws	23	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Jul-15
1408	RotColl	21	<input checked="" type="checkbox"/>		
1409	RodTarg		<input checked="" type="checkbox"/>		
1410	CRY2		<input checked="" type="checkbox"/>		
1411	MicOpt	20	<input checked="" type="checkbox"/>		
1412	PTarg	22	<input checked="" type="checkbox"/>		
	fiber BLM				
1420	TDI		<input checked="" type="checkbox"/>		
1421	MultiMat		<input checked="" type="checkbox"/>		



Transnational Access within EuCARD-2



- So far 4 teams with international members