

Extracted ion beam

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Content

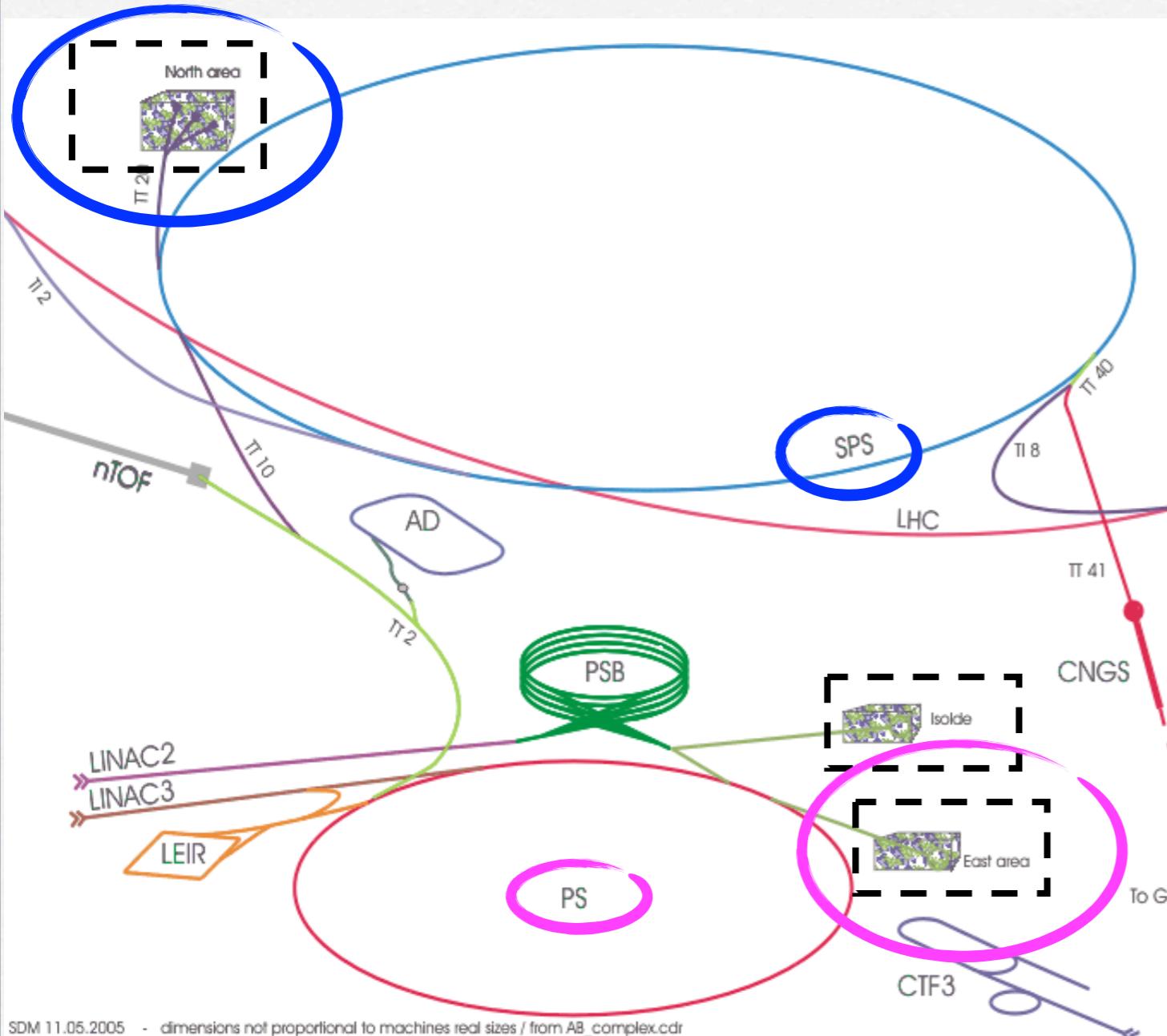
- Test beam facilities @ CERN
- North Area and H8

DISCLAIMER:

All information was taken from CERN website*,
unfortunately it has not been validated by SBA
beam physicists

*<http://sba.web.cern.ch/sba/>

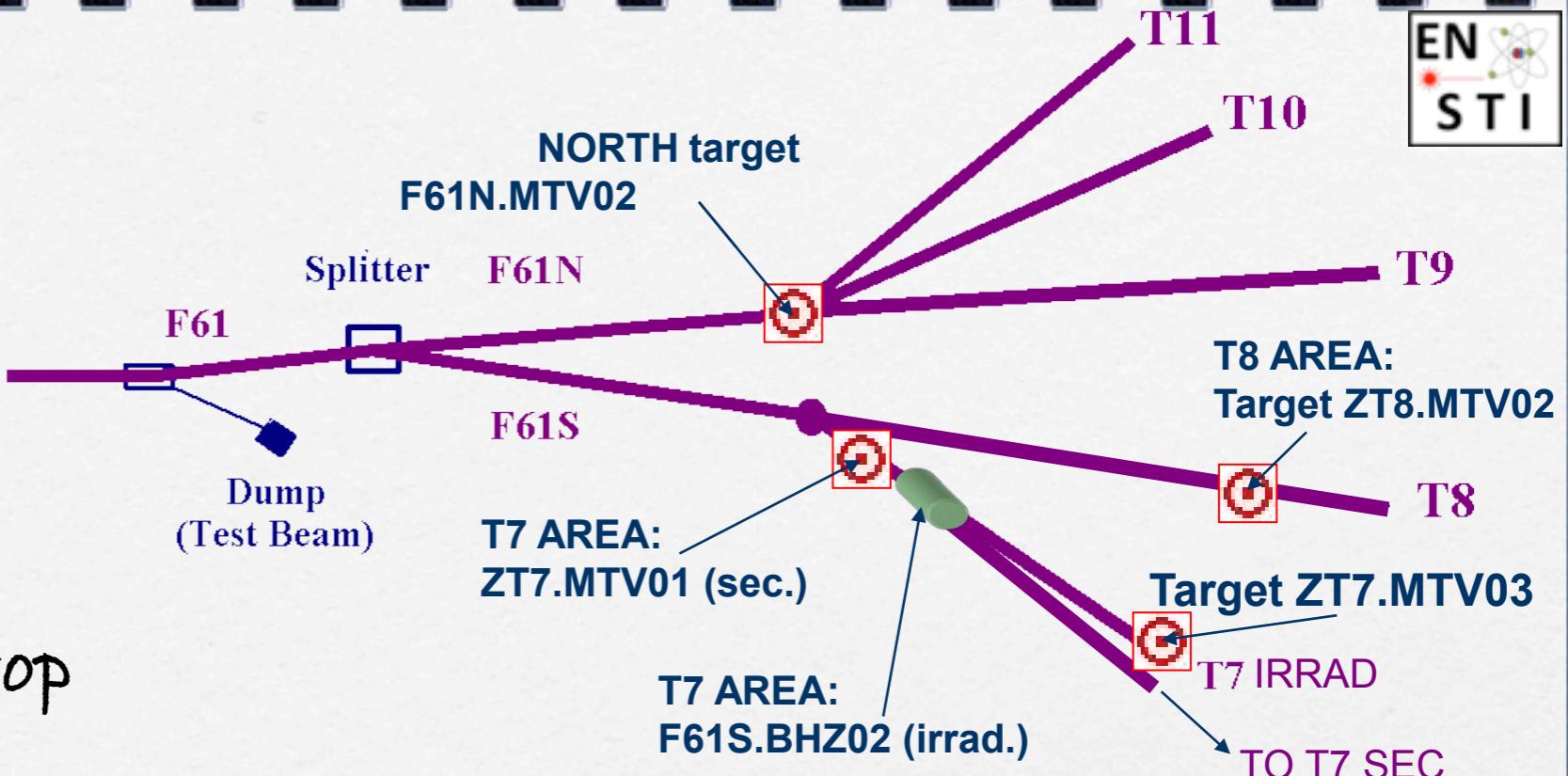
Test beam facilities @ CERN



- The North Area is the test beam area fed by the SPS
- The East Area is connected to the PS

East Area

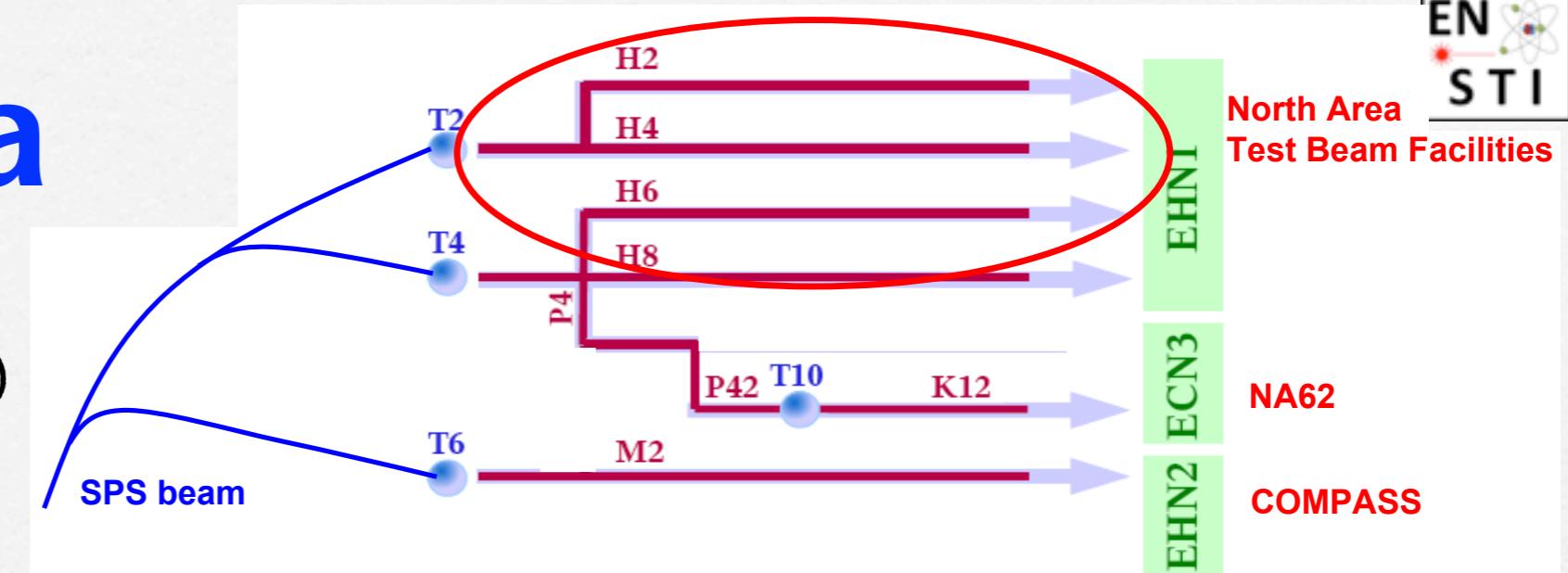
- Particle from the 24 GeV/c PS beam:
- 2.4 s cycles (flat top ~ 400 ms)
- cycles shared between "NORTH" and "SOUTH" areas
- more information:
<http://gatignon.web.cern.ch/gatignon/EastArea/>



	Particles	Momentum	Angle
T7	secondary	10 GeV/c	0
T8	primary (DIRAC exp)	24 GeV/c	0
T9	secondary	15 GeV/c	0
T10	secondary	7 GeV/c	61.6 mrad
T11	secondary	3.5 GeV/c	149.2 mrad

North Area

- SPS protons (ions):
- 400-450 GeV/c (Z)
- 43.8 s cycle, 9 s flat top
16.3(4) s if no LHC
14.2 (4) s for ion
- full energy range:
[10, 400] GeV/c
- beams with several types particles
(e , π , p , μ , Pb)
- high rates possible



	Particles	Momentum	Intensity (rad limit)
H2	secondary, tertiary	400 GeV/c max	$< 10^8$
H4	primary, secondary, tertiary	400 GeV/c max	$< 10^8$
H6	secondary, tertiary	205 GeV/c	$\sim 10^8$
H8	primary, secondary, tertiary	400 GeV/c max	$\sim 10^8$

North Area beams

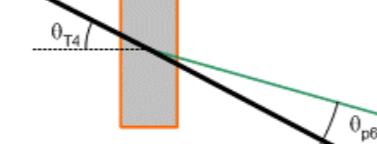
	Particles	Momentum	Intensity
H2	pions (+) pions (-) electrons Pb ions	200 GeV/c 200 GeV/c 150 GeV/c 400 GeV/c/Z	9×10^7 3×10^7 $\sim 10^6$ $\sim 10^5$
H4	pions (+) pions (-) electrons protons (primary) Pb ions (primary)	200 GeV/c 200 GeV/c 150 GeV/c 400 GeV/c 400 GeV/c/Z	$9 \cdot 10^7$ $3 \cdot 10^7$ 10^6 $\sim 10^7$ $\sim 10^7$
H6	pions (+) pions (-)	150 GeV/c 150 GeV/c	10^8 4×10^7
H8	pions (+) pions (-) protons (primary) Pb ions (primary)	200 GeV/c 200 GeV/c 450 GeV/c 400 GeV/c/Z	2×10^8 7×10^7 $\sim 10^7$ $\sim 10^6$

H8: primary particles

SPS beam
from LSS2

Target
(Pb, Be)

T4

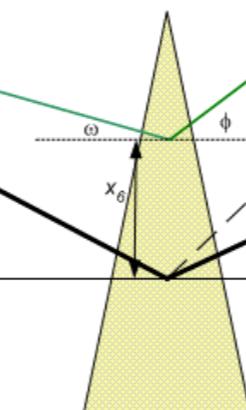


wobbling
magnet

B3T

θ_{T4}

θ_{p6}



x_6

ω

ϕ

11.2 mrad

14 mrad

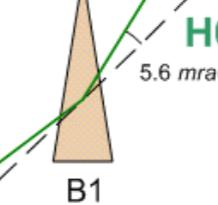
5.250 m

TAX

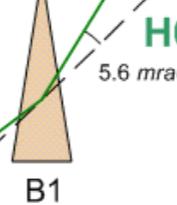


θ_6

y



B1

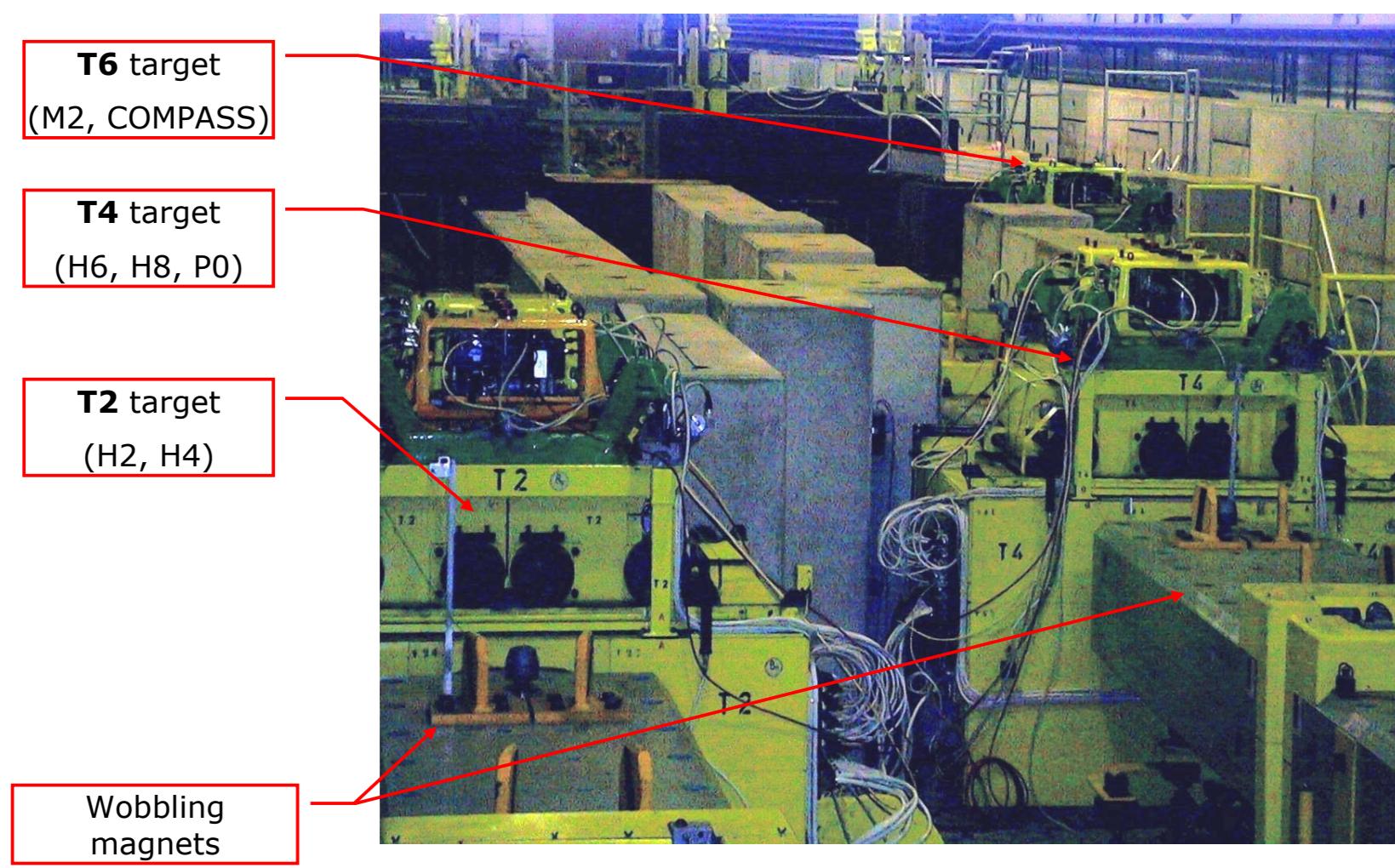


H8

Micro-
collimator
(< 1 mm)

Target Station T4 Wobbling - Explained
Ilias Efthymiopoulos (2003)

H8: particle selection



The targets

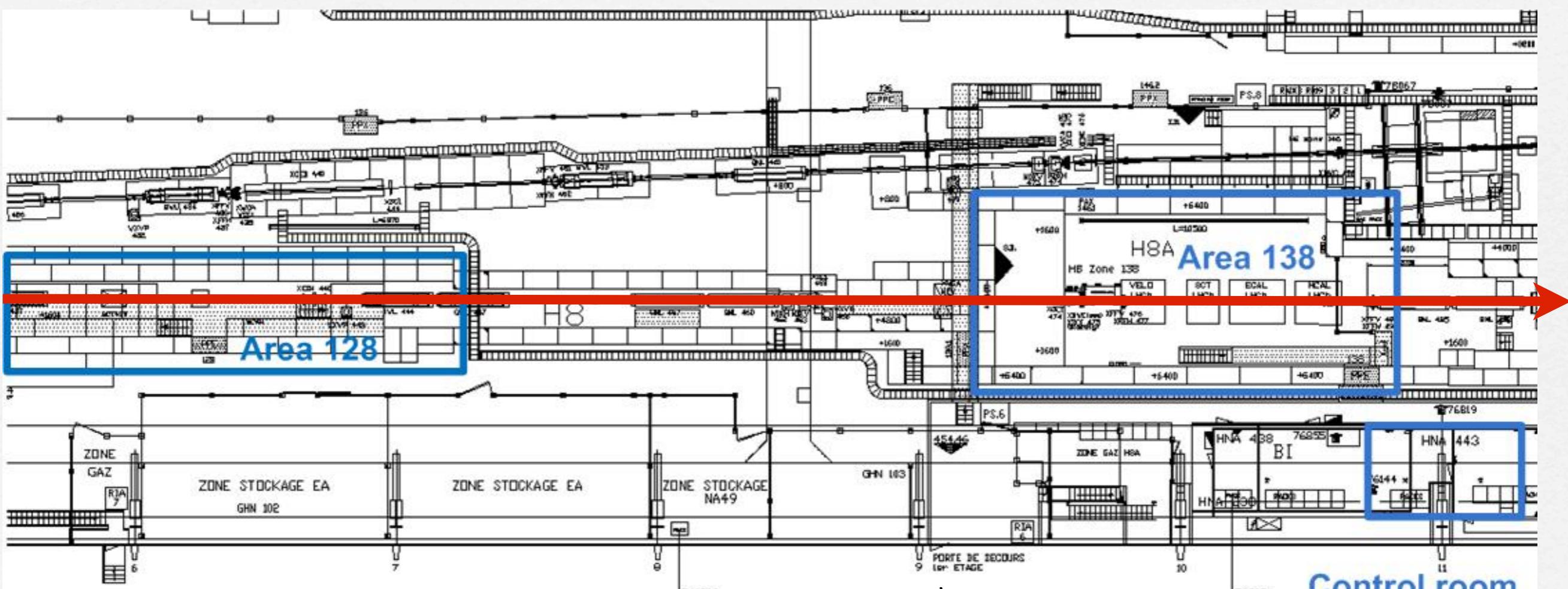
The TAX



H8 beam line



H8 beam line



J. Lendaro
workshop on crystal collimation (2010)

Area 128



H8 beam line



Control
Room

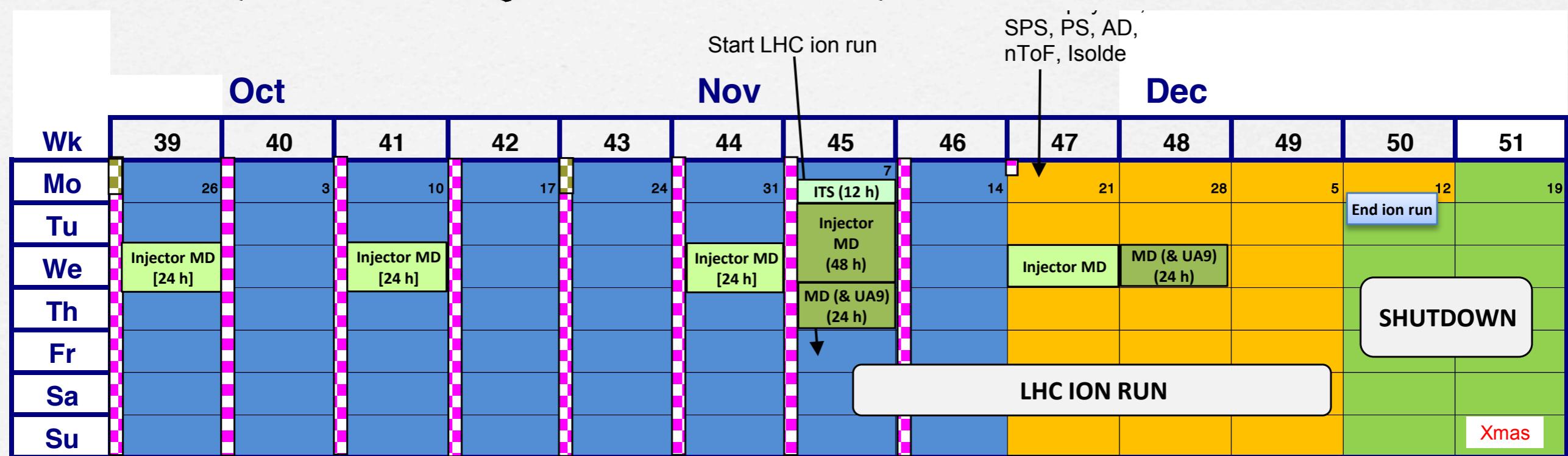


Area 138

J. Lendaro
Workshop on crystal
collimation (2010)

Physics program with ions

- For safety reason, ion beam at full intensity can be provided only when proton injection is impossible



Conclusion

- Ion test beam is possible in the North Area facility at CERN (H8 beam line):
 - momentum up to 400 GeV/c/Z
 - intensity up to $\sim 10^6$
 - micro-collimator safety interlock
- Ion physics at CERN should start after November, 11th