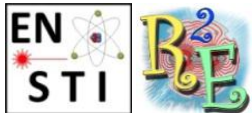


LHC radiation levels

*Report at the RadWG, 11th
February 2013*



M. Calviani, P. Mala for the MCWG

Summary of p-p 2012 operation

- ▶ Summary of **p-p 2012 operation** available at:

- ▶ RadWG 5th December:

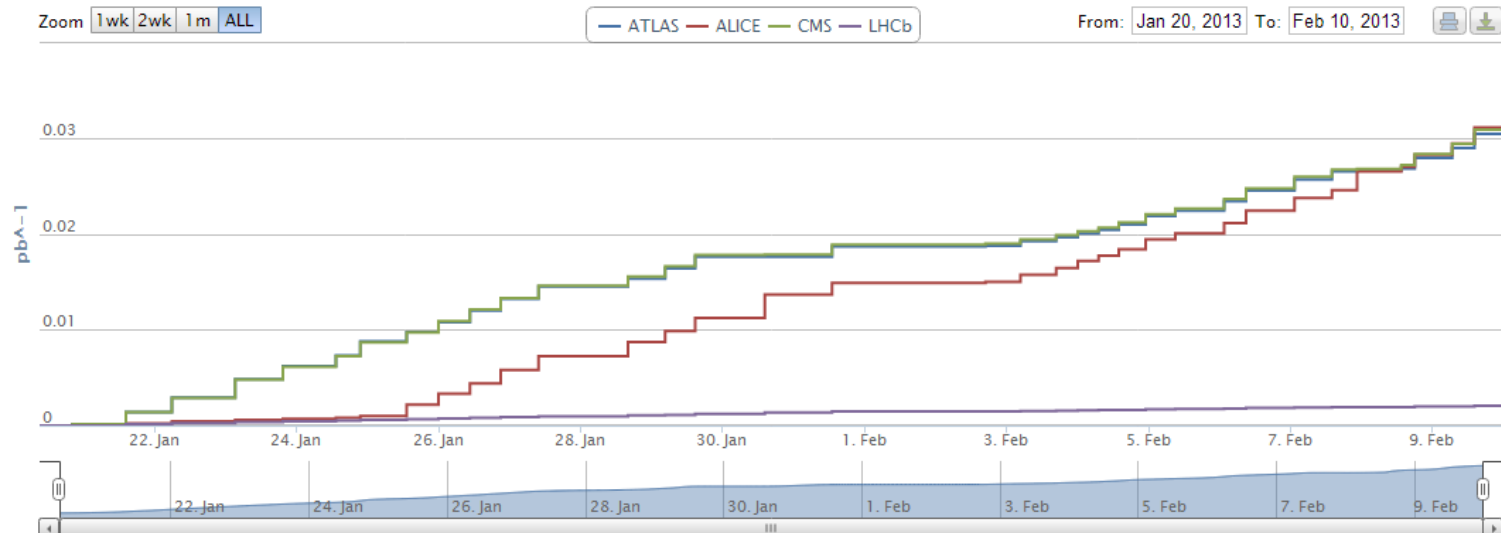
<https://indico.cern.ch/getFile.py/access?contribId=1&resId=1&materialId=slides&confId=211488>



Cum lumi (fb ⁻¹)	2012	2013 (pPb)	Ratio (2013/2012)
ATLAS	23.1 fb ⁻¹	31.2 nb ⁻¹	~10 ⁻⁶
CMS	23.1 fb ⁻¹	31.68 nb ⁻¹	
ALICE	9.7 pb ⁻¹	31.94 nb ⁻¹	~10 ⁻³
LHCb	2.2 fb ⁻¹	2.12 nb ⁻¹	~10 ⁻⁶

▶ Main sources of losses (lumi is minimized) during the pPb run is localized losses

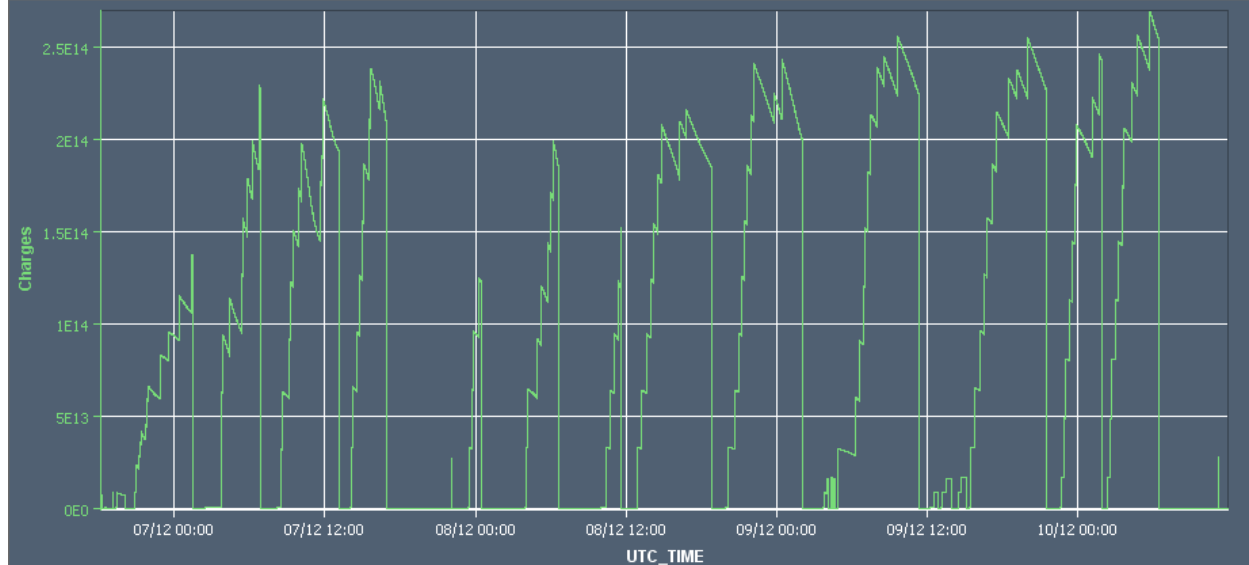
Integrated Luminosity Evolution



Timeseries Chart between 2012-12-02 17:56:00.000 and 2012-12-31 17:56:00.000 (UTC_TIME)

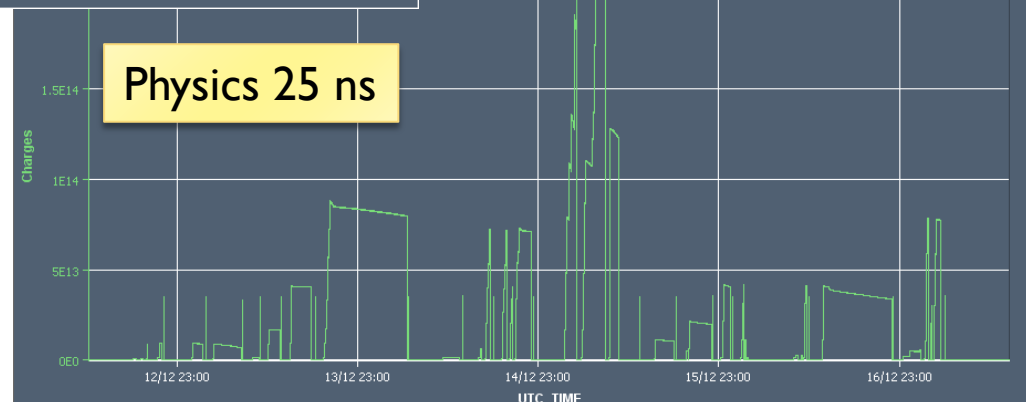
LHC.BCTDC.A6R4.B1:BEAM_INTENSITY

Scrubbing 25 ns



- ▶ Performed from 6th to 17th December 2012

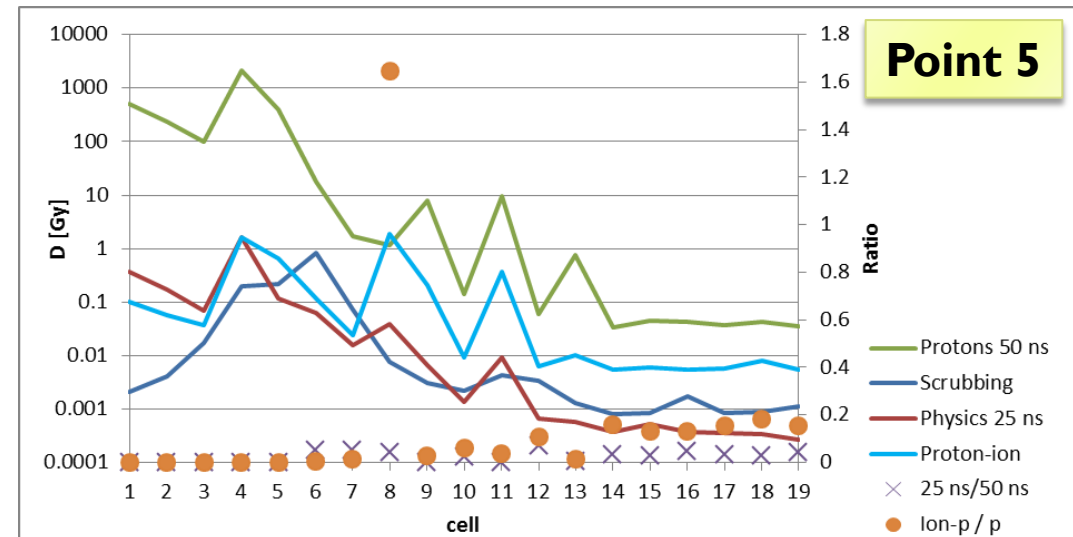
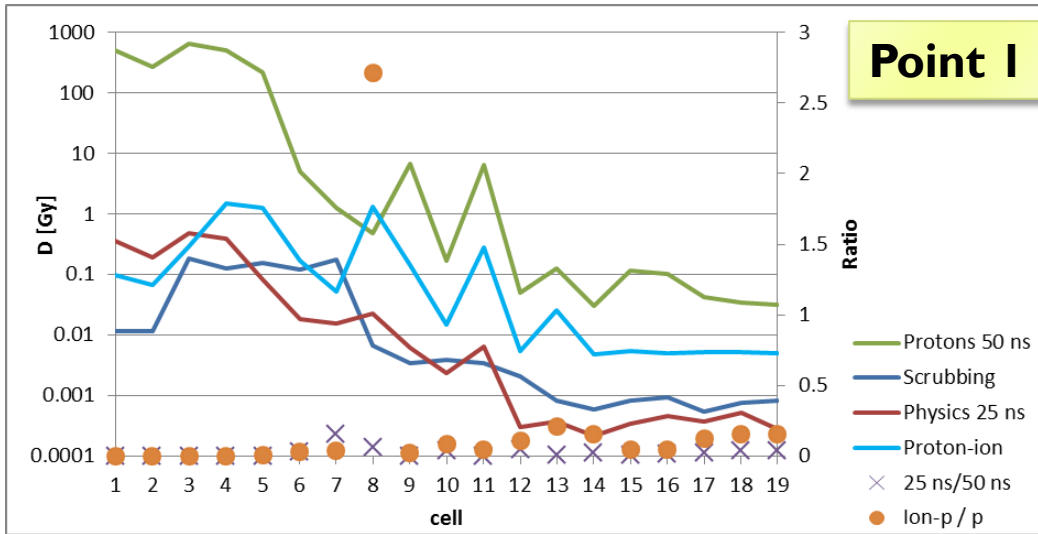
2-12-31 17:56:00.000 (UTC_TIME)



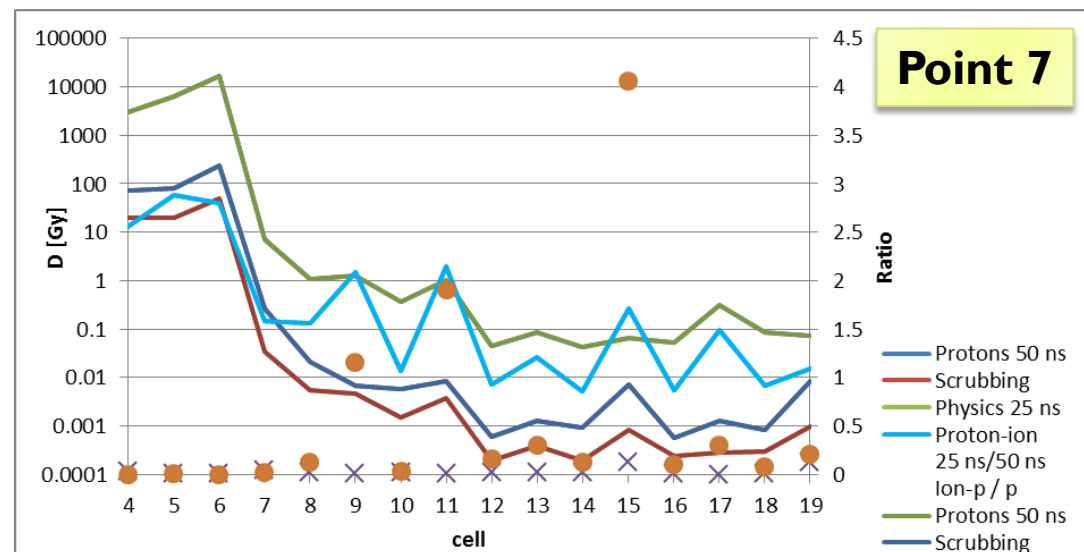
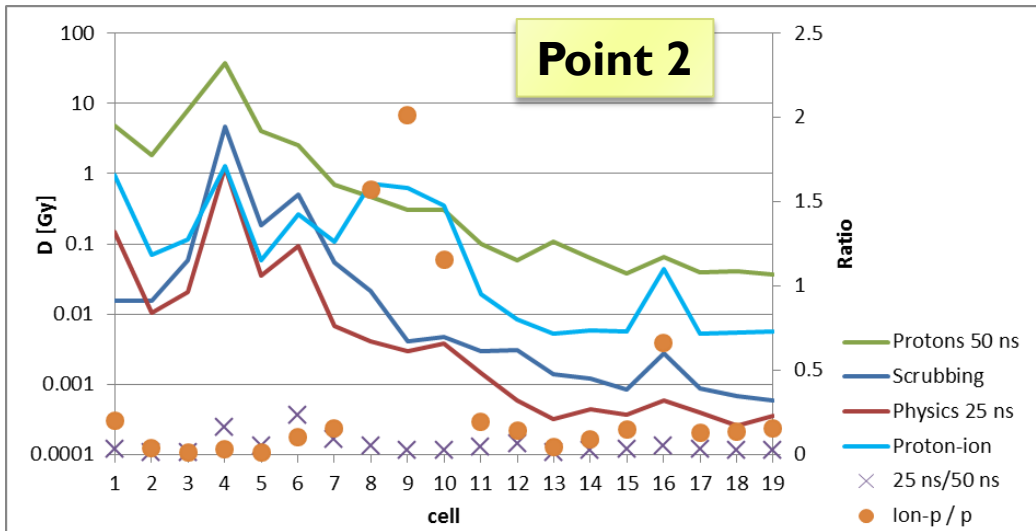
- ▶ From 20th January to 10th February 2013
- ▶ **Radiation levels are orders of magnitude less than the pp run** for shielded areas
 - ▶ UJ13/17 (tunnel!):
 - ▶ $\sim 10^{11}$ during 50 ns run
 - ▶ 10^7 during 25 ns scrubbing + physics
 - ▶ $\sim 10^7$ during pPb run
 - ▶ RR13/17/53/57 (tunnel!):
 - ▶ $\sim 5 \cdot 10^8$ during 50 ns run
 - ▶ $\sim 10^{6/7}$ during 25ns scrubbing + physics
 - ▶ $\sim 10^6$ during pPb

- ▶ **Localized spots exists** as during the Pb-Pb due to off-momentum particles, ending up in the **DS/ARC** (hadronic showers in the DS contributing to tunnel radiation)
 - ▶ Cells from 7 (DS) to 17 (ARC)
 - ▶ See R2E Review 2011
(<https://indico.cern.ch/getFile.py/access?contribId=16&sessionId=1&resId=1&materialId=slides&confId=157386>)

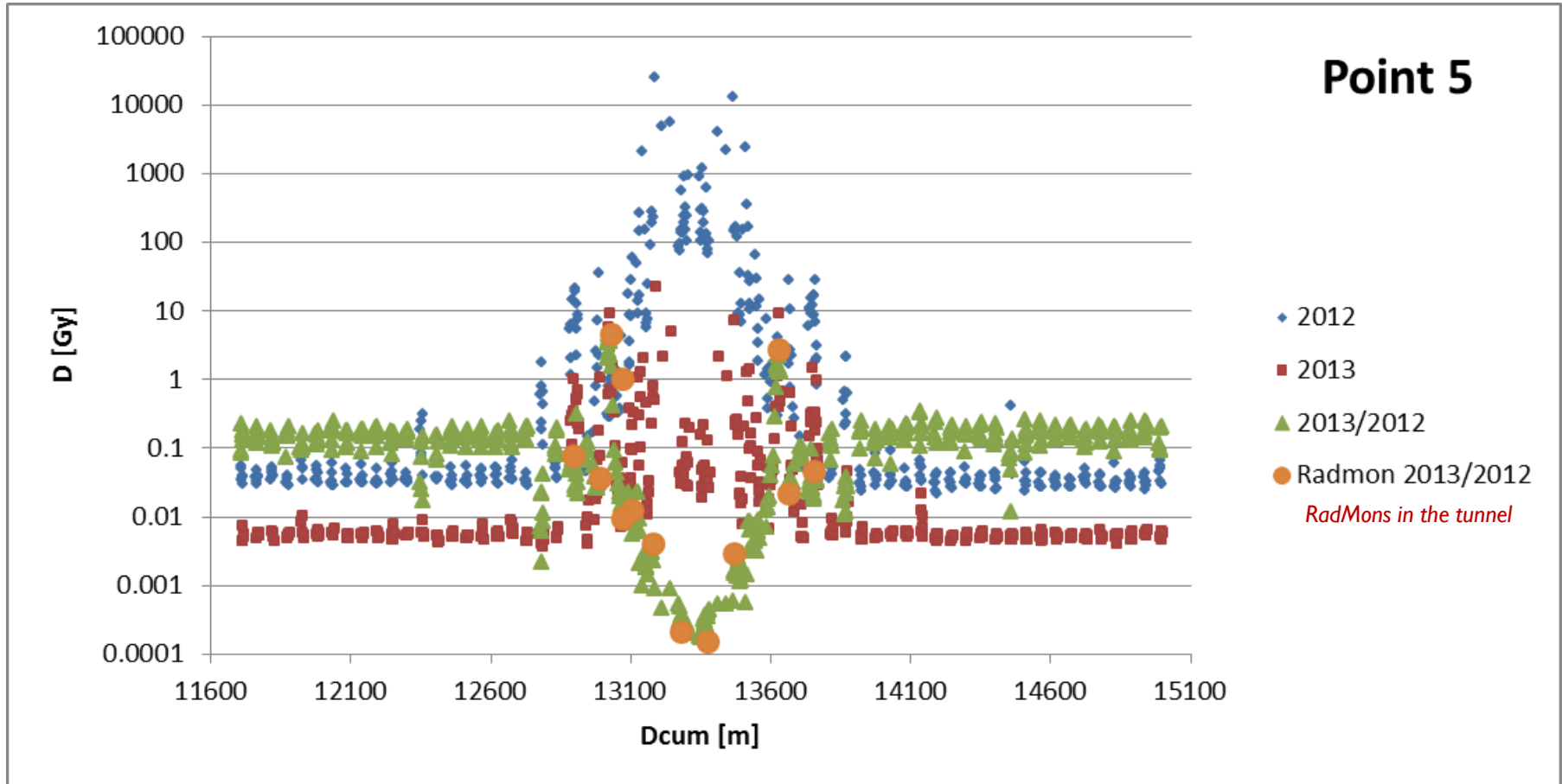
Summary of operation and comparison



Summary of operation and comparison



Dose measured with BLMs



pp intermediate energy run

- ▶ An intermediate energy pp run is foreseen at **1.38 TeV/beam**
- ▶ Increase of beam intensity from 80,500 to 1374 bunches
- ▶ **We'll follow up but no significant failures are expected – no more than a standard physics fill**