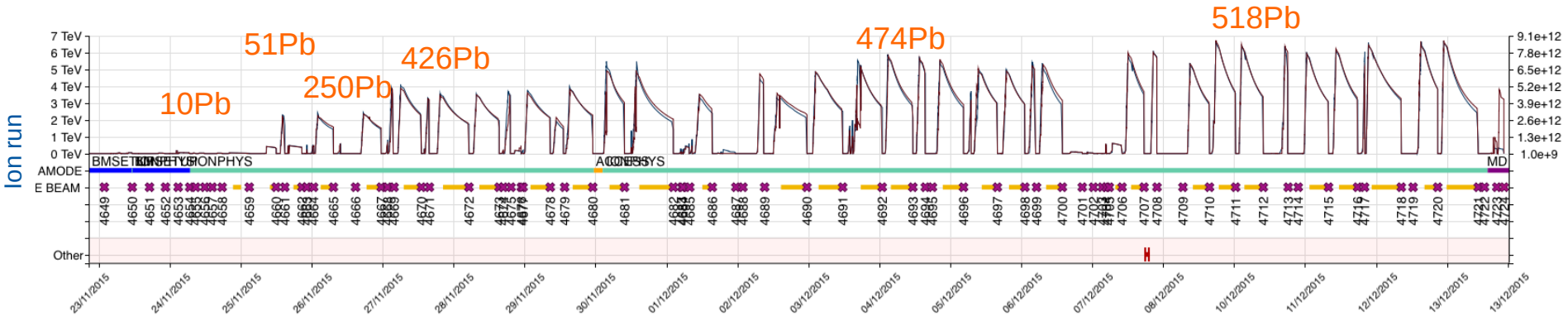
Proposal for Ion Intensity Ramp-up

J. Uythoven, J. Wenninger, D. Wollmann, M. Zerlauth

Re-cap ion-run 2015



- max 518 Pb^{82+} bunches with 1.7e10 charges/b (2.1e8 Pb^{82+}/b), total stored beam energy ~ 9 MJ
- Ramp-up: 10 b → 51b → 250 b → 426 b
- Followed by slow increase up to 518 Pb bunches

2018 Ion run (6.37 TeV/Z)

- max ~ 620 Pb bunches (~ 11 MJ - 100ns spacing)
- later ~790 Pb bunches (~14 MJ - 75 ns spacing),
- assuming 1.7e10 charges/bunch, i.e. 2.1e8 Pb^{82+}/bunch

# bunches	# charges	# ions (Pb82+)	stored energy (MJ)
3	5.1E+10	6.2E+08	0.052
10	1.7E+11	2.1E+09	0.173
50	8.5E+11	1.0E+10	0.87
250	4.3E+12	5.0E+10	4.3
450	7.7E+12	9.3E+10	8.8
620	1.1E+13	1.3E+11	10.7
700	1.2E+13	1.4E+11	12
790	1.3E+13	1.6E+11	13.7

Proposal for Intensity Ramp-up

- **Setup** with up to 10 Pb^{82+} bunches
- Loss maps / AsynchDumps as specified by collimation and ABT
- ~50 Pb^{82+} bunches, **one fill**, 2h stable beams (0.9 MJ)
- ~250 Pb^{82+} bunches, **two fills**, total > 6 h stable beams (4.3 MJ)
- ~450 Pb^{82+} bunches, **two fills**, total > 6 h stable beams (8.8 MJ)
- **Check list** before start of full physics production
- → 620 Pb^{82+} bunches (10.7 MJ)

Check list then switch from 100 ns → 75 ns:

- Step back to ~450 Pb^{82+} bunches, **one fill**, > 4 h stable beams
- → 790 Pb^{82+} bunches (13.7 MJ)
- **Final check list** at the end of the ion run

Conclusion

- Stored beam energies in ion run are factor 20 smaller than with high intensity proton operation
- **5 fills** for short intensity ramp-up → based on 2015 experience
- Check lists
  - at the end of intensity ramp-up
  - before switch from 100 ns to 75 ns
  - at the end of ion run