WP2&5 priority MD review

for discussion

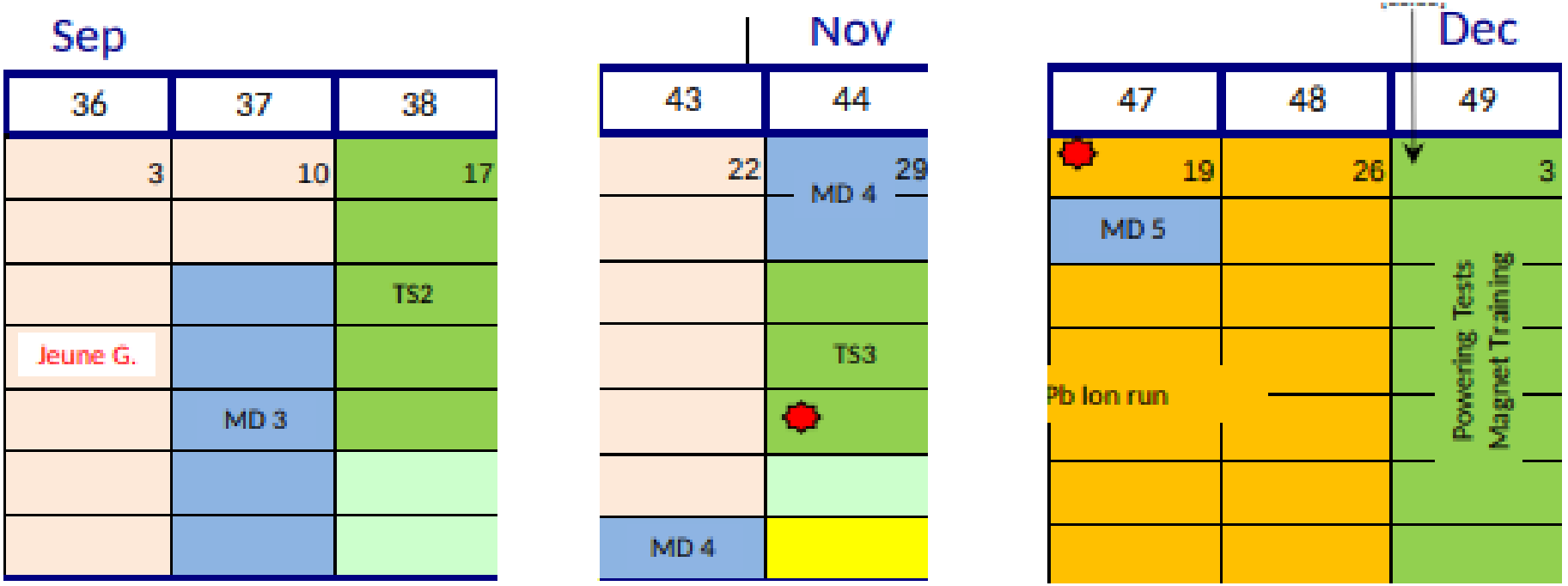
R. Tomas from discussions with* X. Buffat, S. Fartoukh, G. Iadarola, J. Jowett, A. Mereghetti, E. Metral, S. Redaelli, G. Sterbini, J. Uythoven…

127th Hi-Lumi WP2 Meeting
Aug 21st 2018

All MD requests in: asm.cern.ch

*Due to vacations I could not discuss with other colleagues

Schedule



- **8 proton MD days left** (+1 with ions), hoping for good LHC performance to get 2 or 3 more days.
- Ion optics+aperture commissioning shifts to be attached to MD blocks (from physics time)

Pending high priority MDs

- ATS:
  - Round optics high telescopic factor for MO/BBLR interplay and with >600 bunces for e-cloud: 2-3 shifts
  - Flat: done but request of more trains would need 1-2 shifts, needed? (β-beating and β*-beating~20%)
  - (TCDQ leveling: 2h)
- Heat-load and e-cloud (mostly MD4 because of 16L2):
  - 8b4e high intensity: 2-3 shifts (MD4)
  - Doublets: 2-3 shifts (MD4)
  - 12b high intensity: 1 shift (MD4)
  - Heat-load versus bunch length: ½ shift
  - Heat-load at 0.8e11 ppb: 1h
  - (e-cloud with flat orbit: 1 shift)

Pending high priority MDs

- Coherent / Impedance:
  - BTF: 1 shift
  - Noise with new ADT pick-up electronics: 1 shift (MD4)
    - Related: MD4063, New ADT signal processing for large tune spread acceptance (D. Valuch)
  - Stability of 12b high intensity at FT: ½ shift (MD4)
  - Instability growth rate versus chromaticity at injection: ½ shift
  - Not so high priority, for completeness:
    - Linear coupling due to beam-beam interaction
    - Anti-damper MD

Pending high priority MDs

- BBLR wire:
  - Compensation during crossing/beta*-leveling: 1 shift
  - EoF: Stronger wire
  - Flat optics + wire: 1 shift (MD4)
- Optics control:
  - Luminosity versus waist shift: 1 shift
  - Replicating HL-LHC DA: 1 shift (MD4?)
  - (High order resonance driving terms: 1 shift → merge with HL-LHC DA?)

Pending high priority MDs

- Crystal:
  - Crystal with ions in proton run to prepare ion run with crystal collimation: 2 shifts (MD3&4)
  - Partially striped ions (not high priority): ½ shift
- Collimation:
  - Proton quench margins in IR7: 1 shift (MD4?)

    (competing with quench heater studies for last slots)
  - Halo scraping: EoF

Summary high priority proton MDs

- About 17 shifts needed for high priority MDs *only* from WP2&5 point of view
  - 11.5 shifts requested in MD4
- 8 current MD days amount to ~20-24 shifts (MD efficiency could be 75-85%!)
  - 3 days in MD4 ~7-9 shifts
- Plus many other topics: BI, Coll, FCC, MP, OMC, PBC, RF, OP…
- We need 2-3 more days in MD4

Ion MD proposals

- BFPP quench test in IR1: 1 shift
- EoF: Max. luminosity in IP1/5 to estimate HL-LHC reach (If quench → 1 shift recovery)
- Collimation quench test: 1 shift

  see: https://indico.cern.ch/event/738962/
- 1 MD day in ion run ~OK to fit requests for now

Other MDs...

- Colored noise excitation for halo depletion
- Tight collimation settings at injection for HE-LHC/RunIII
- Parallel automatic coll. alignment
- BLM response at collimators
- 50Hz perturbation
- Asynch. beam dump @ FT
- RF power limitations and injection oscillations
- Beam size from quad. BPM signal
- Counteracting coupling decay at injection
- Single particle DA of current operational configuration
- Improving b3 modeling in early ramp
- ...