

Questions to be answered by the end of 2012 & required MDs

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General questions

- **Brightness/transverse emittances:**
 - Why transverse emittances were larger before 2011? Fast scrubbing or BI issue? How reliable are measurements now?
 - Do we need to put a lot of efforts to decrease transverse emittances in injectors if they will be blown up in any case in LHC, especially if this effect is intensity or emittance dependent?
- **e-cloud**
 - Are we suffering from it now?
 - Would it be harmful for future intensity/performance?
 - Can scrubbing still be efficient (with SEY close to 1.3)?

Questions for PSB & PS

- PSB

- How well impedance budget is known (in addition to SC)? => MDs?
- Is Finemet cavity/impedance ok?

- PS

- What is impedance budget of the PS?
 - Is tune spread of 0.26 is really “a hard limit”?
 - How far limitations due to coupled-bunch instabilities could be pushed by FB(s)?
 - **PS/SPS longitudinal transfer**
 - Can we live with larger longitudinal emittance/losses or
 - Can we have more RF voltage at 80/40 MHz in the PS?
Does one really need a “hot spare” (or “hot power” is sufficient)?
- => Continue MD studies

Q20 optics in the SPS

- Performance reach:
 - longitudinal beam stability versus (limited) 200 MHz voltage
 - working point /“space charge” limit
 - ⇒ MDs for **dedicated** optimisation and studies
- Should we inject this beam to LHC in 2012?
 - longer bunches (larger emittances and more losses)
 - ⇒ MD (?) capture losses in LHC – can we accept more?
 - same bunch length but smaller emittances?
 - ⇒ MD for batch-by-batch longitudinal emittance blow-up in LHC
 - ⇒ transfer lines
- Is it useful for other SPS cycles?
 - FT&CNGS – fast acceleration, transition crossing
 - ions: IBS, space charge

Questions for SPS

- **Sparking ZS** – a limitation till 2040? Should we look for
 - “operational” solutions (bumps, voltage configuration, ion traps improvement...)?
 - ⇒ **MDs** at the test installation
 - new design (would it be better?)
 - mitigation by beam?
 - ⇒ a new RF system at 400 MHz? Less limitations for BL Mode (bunch shape control)
 - ⇒ new filling schemes (e.g. 3 batches)?
- **Heating** of elements with future high (HL-LHC) intensities
 - ⇒ impedance identification (+ reference measurements <LS1) in **MDs**
- **Longitudinal instability** threshold for 50 ns and 25 ns beams. ⇒ **MDs**
Impedance source?

More questions (H.D.)

- Are the various batch compression schemes in the PS feasible? Answer after MDs before LS1?
- What is the minimum transverse emittance that can be transported well conserved through the injector chain?
- Feedback question for the SPS: how far longitudinal limitations could be pushed by (new) FB(s)? 800 MHz performance after upgrade?