

## LHC MD REQUESTS

Date received	Requestor	Length	Description
9/4/2010	Werner Herr	8 hours	<p>Goal: continue commissioning of 3x3 bunch train configuration, which needs crossing angle separation at IR1 (factor 2 gain in luminosity)</p> <p>Beam conditions : trains of 3x3 (2-2-2-2 collisions in the 4 IPs), <math>\sim 10^9</math>/bunch - 3.5 TeV collisions - could declare STABLE BEAMS at the end of test- Should serve as starting point for crossing angle operation.</p> <p>Beam diagnostics required: emittance measurements, bunch by bunch tune measurements ...</p> <p>Lumi scan in presence of crossing angle</p>
9/4/2010	Werner Herr	2 x 8 hours	<p>Goal: Bunch measurements with different bunch train configurations (4 configurations)</p> <p>Beam conditions : trains of 4x4, <math>\sim 10^9</math>/ bunch - 3.5 TeV collisions - NON STABLE BEAMS</p> <p>Beam diagnostics required: bunch by bunch tune measurements</p>
9/4/2010	Werner Herr	8 hours	<p>Goal: Coherent beam-beam effect studies</p> <p>Beam conditions : 1x1 or 2x2 (simplest configuration), <math>\sim 10^9</math>/ bunch - 3.5 TeV collisions - NON STABLE BEAMS</p> <p>Beam diagnostics required: bunch by bunch tune measurements</p>
9/4/2010	Werner Herr	3x8 hours	<p>Goal: Parameter definition</p> <p>Beam conditions : need squeeze commissioned for single beam - trains of 4x4-<math>\sim 10^9</math>/bunch - 3.5 TeV - squeeze with i- colliding beams; ii-separated beams; iii- partially separated beams</p> <p>Beam diagnostics required: Emittance measurement, life time</p>
9/4/2010	Werner Herr	8 hours	<p>Goal: commissioning of short trains: define procedure and possible problems</p> <p>Beam conditions : trains of 6x6, <math>\sim 10^9</math>/bunch - crossing angle commissioning (at least in one IR)- 3.5 TeV collisions - could declare STABLE BEAMS at end of tests-</p> <p>Beam diagnostics required: Emittance measurement, life time</p>
27/4/2010	Helmut Burkhardt		<p>Miscellaneous luminosity calibration, background studies</p> <p>1. Luminosity calibration scans. Done in physics with stable beams. Requested by the experiments.</p>

			<p>Extended luminosity scans: +/-5 sigma with length scale calibration by displacing both beams together by at least +/- 1 sigma.</p> <p>2. End of fill background study on cross talk between experiments. Before dumping the fill: Re-separate beams, IP by IP one every about 5 min. In stable physics with experiments taking data.</p> <p>3. End of fill background study on halo-background component. Enhance/reduce tertiary halo losses on TCTs by moving beams or TCTs by fractions of a sigma in steps. Stay at each step for a couple of minutes.</p>
27/4/2010	Massimo Giovannozzi		<p>Study of a new optics solution for IR3 and IR7 without trim quadrupoles to improve beta-beating at injection. Standard condition for optics measurements. One/two shifts.</p>
27/4/2010	LCU team		<p>Study non-linear beam dynamics (injection and top energy, single bunch, few shifts required. End-of-fill time could be useful too):</p> <ul style="list-style-type: none"> <li>- Detuning with amplitude</li> <li>- Non-linear chromaticity combined with off-momentum beta-beating</li> <li>- b3 correction with spool pieces</li> <li>- Adiabaticity of the AC dipole by exciting closer than usual at injection energy.</li> <li>- Measurement of sextupolar resonance driving terms with the AC dipole at injection and top energy.</li> </ul>
27/4/2010	E. Métral et al.		<p>Detailed measurements of the transverse single-bunch coherent tune shifts vs. intensity at LHC injection =&gt; These measurements were already performed by some people in the last weeks but without knowing all the machine and beam parameters. As our predictions with nominal machine and beam parameters are ~ 4-5 times smaller we believe that it is very important to schedule these studies asap. In addition, we would like also to move all the collimators of IR7 to compare the measured tune shifts from all the IR7 collimators to our predictions.</p>
27/4/2010	E. Métral et al.		<p>Same thing at 3.5 TeV/c, to study the effect of energy on these tune shifts, which will give us some info about the missing impedances (collimators or the rest of the machine). To do so we could inject a nominal bunch, measure its tune, and then scrape it to reduce its intensity while monitoring the transverse tunes.</p>
27/4/2010	E. Métral et al.		<p>Single-bunch instability rise-time at 450 GeV/c and 3.5 TeV/c vs. chromaticity (or at least for 1 negative chromaticity) to make a first check of the real part of our impedance model, which will be important for the</p>

			transverse coupled-bunch instability which is foreseen to be the main limitation in the future.
27/4/2010	E. Métral et al.		Measurements of transverse coupled-bunch instability rise-times vs. chromaticity at LHC injection with “several” bunches (once enough bunches are injected).
27/4/2010	G. Arduini et al.	2 shifts	Hump studies (BLM and BBQ measurements with differ RF configurations
27/4/2010	G. Arduini et al.	1 shift	Hump studies: dependence on beam screen cooling