

SINGLE-BUNCH INTENSITY LIMIT IN THE LHC

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- ◆ **Most critical case = TMCI at 7 TeV (computations done for the nominal beam parameters, i.e. also nominal bunch length...) => SB TMCI intensity threshold. Note that the CB TMCI intensity threshold should be lower (still to be studied in detail)**
 - **Phase 1 (nominal collimators' settings):**
 - **$Q' = 0 + I_{oct} = 0 \text{ A} \Rightarrow N_{bth} \sim 3.4E11 \text{ p/b}$**
 - **$Q' = 2 + I_{oct} = 550 \text{ A} \Rightarrow (\sim 3.4E11 \text{ p/b} <) N_{bth} < \sim 3.9E11 \text{ p/b}$**
 - **Phase 2 (copper secondary collimators) => Preferred option:** see p. 13 of <http://indico.cern.ch/getFile.py/access?contribId=7&resId=1&materialId=slides&confId=55195>
 - **$Q' = 0 + I_{oct} = 0 \text{ A} \Rightarrow N_{bth} > 4.5E11 \text{ p/b}$ (still to be defined if needed...)**
 - **$Q' = 2 + I_{oct} = 550 \text{ A} \Rightarrow N_{bth} > 4.5E11 \text{ p/b}$ (still to be defined if needed...)**

- **IR3MBC** (see http://emetral.web.cern.ch/emetral/ICEsection/Meeting_24-11-10/IR3MBC_ICE_meeting_24112010.ppt)
 - **$Q' = 0 + loct = 0 \text{ A} \Rightarrow Nbth \sim 1.4E11 \text{ p/b}$**
- **Phase 1 (with tightest collimators' settings proposed by RalphA for the 2011 collimation review):**
 - **$Q' = 0 + loct = 550 \text{ A (and emitt} = 2 \text{ }\mu\text{m)} \Rightarrow Nbth \sim 1.8E11 \text{ p/b}$**

REMINDER: The best way to reduce the collimators' impedance remains to open the gaps (and reduce the total length of the collimators)!

**Smaller impedance effects
if larger betas (S. Fartoukh)**