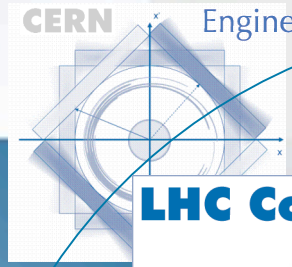
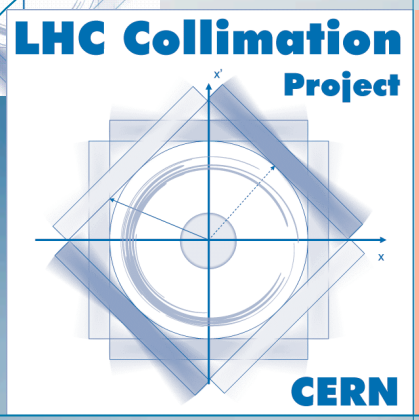


Engineering Department



Phase II Collimators : design status

LHC Collimation Working Group

24th August, 2009

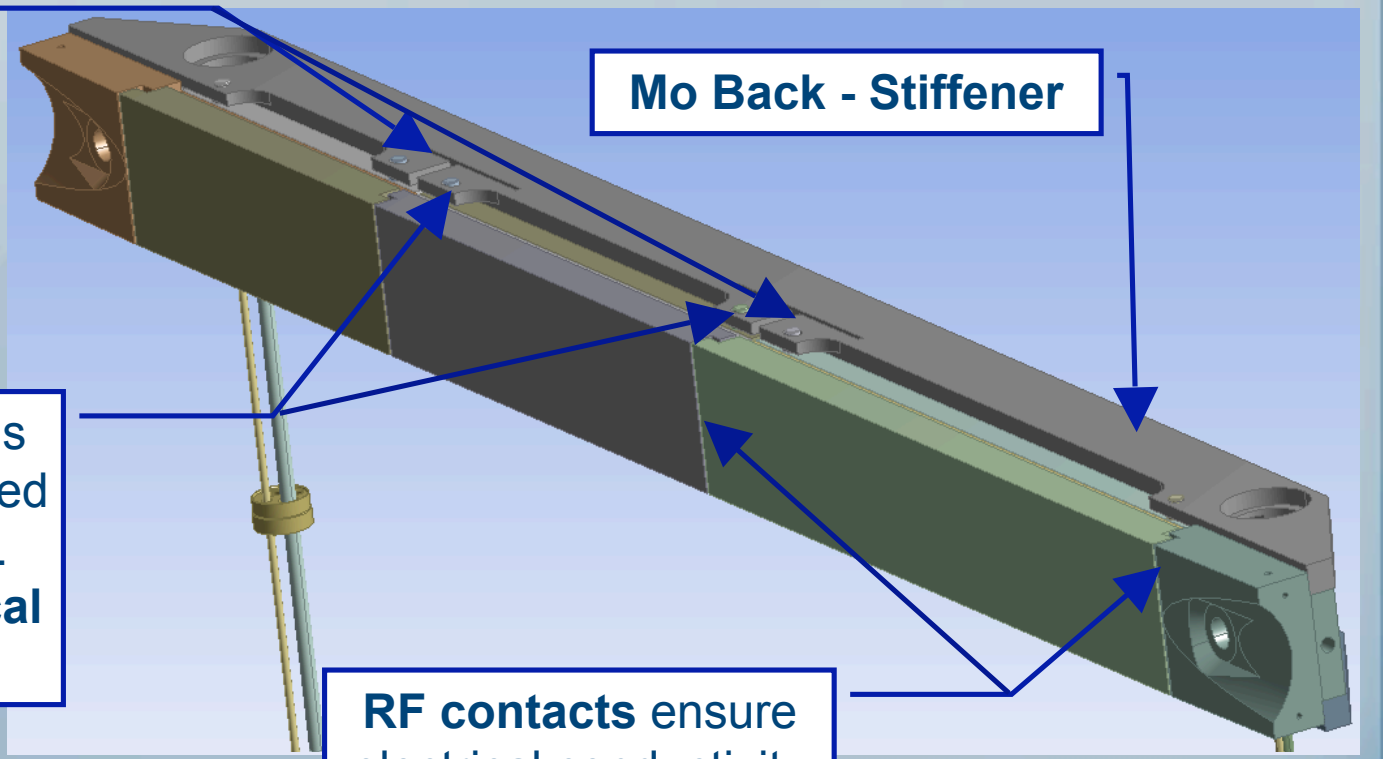
A. Dallocchio, A. Bertarelli

on behalf of the Phase II Collimation design team

Design Baseline (sol. 2)

Sol. 2 finally chosen (12th CDM2 May 2009): equipped jaw (3 sectors) with 2 intermediate adjustable supports to obtain best geometrical stability.

Fine adjustment system



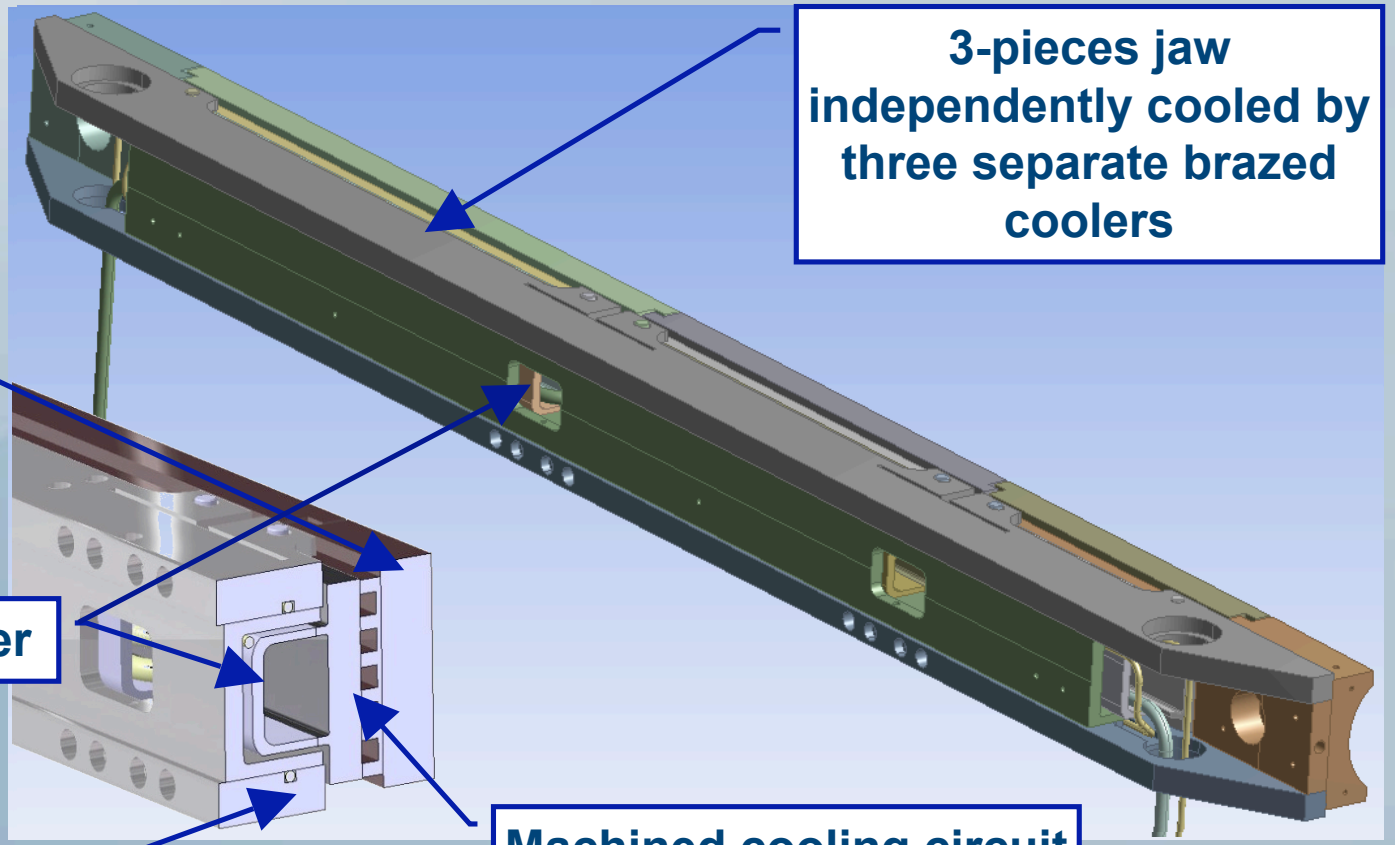
Mo Back - Stiffener

Cut jaw: each piece is independently supported on the back stiffener. **Enhanced geometrical stability**

RF contacts ensure electrical conductivity between jaw pieces

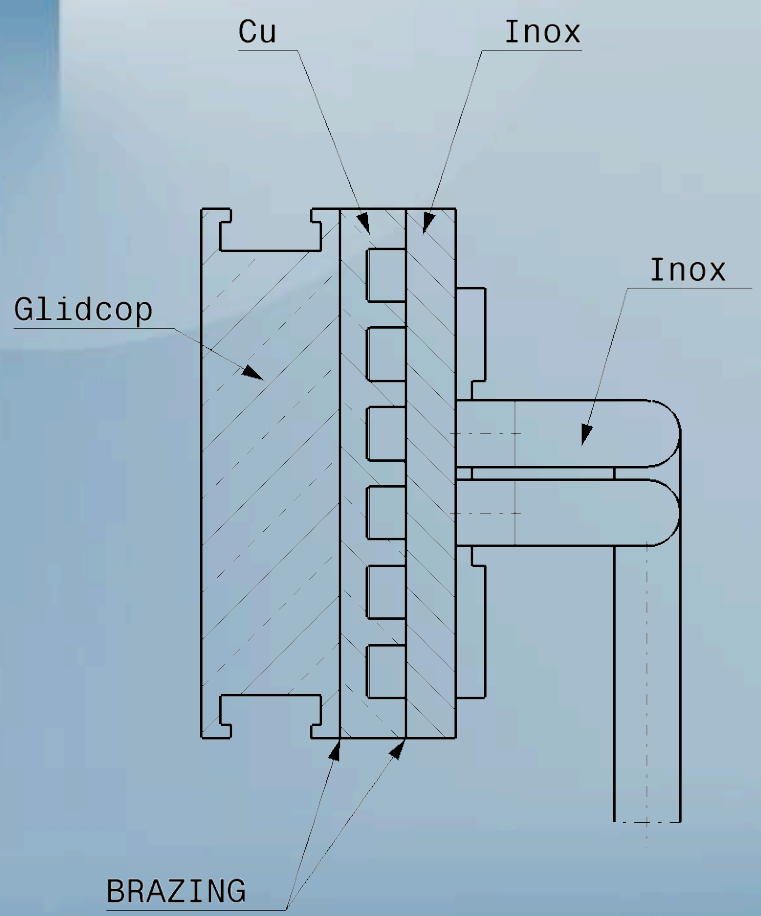
Preliminary FEM estimation: 50÷60μm with GlidCop jaw in nominal condition.

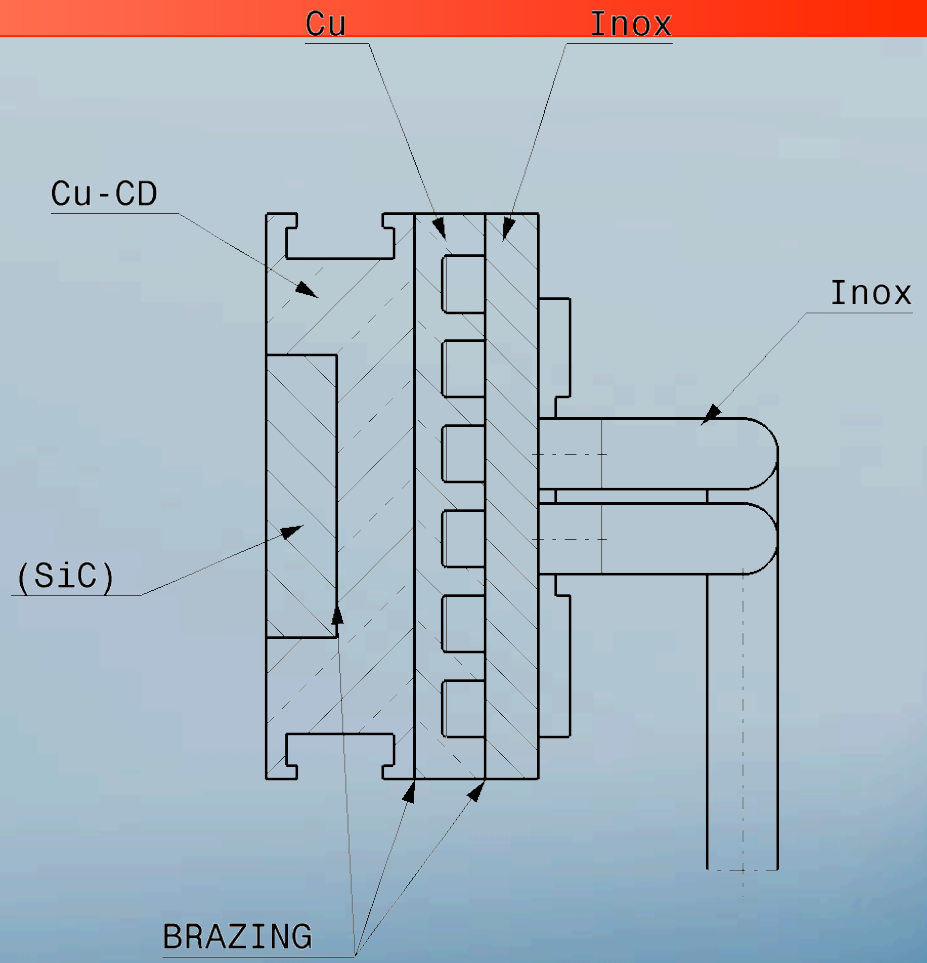
Design Baseline (sol. 2)



Alternative Materials

Modular design approach allows the choice of different materials for the collimator jaws: **Metal jaw** vs. **Ceramic jaw**... (waiting for further specifications)





Design status and future outlook

Mechanical design

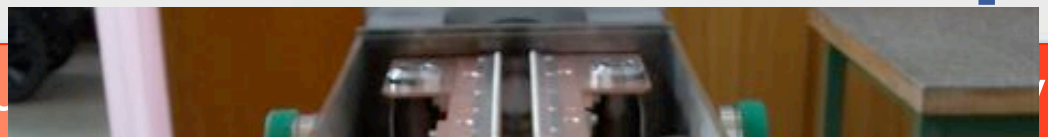
- Preliminary design study of the jaw assembly completed.
- Drawing folder (60 drawings) provided to main workshop for cost estimation, delivery time for production of a full prototype and possible design optimization (Mo vs. INOX back-stiffener depending on costs/benefits).
- Prototype of Phase II moving tables (linear shaft ball bearings). successfully tested 24.000 cycles. New Endurance test ongoing.
- Cooler prototypes so far successfully tested (final tests ongoing).

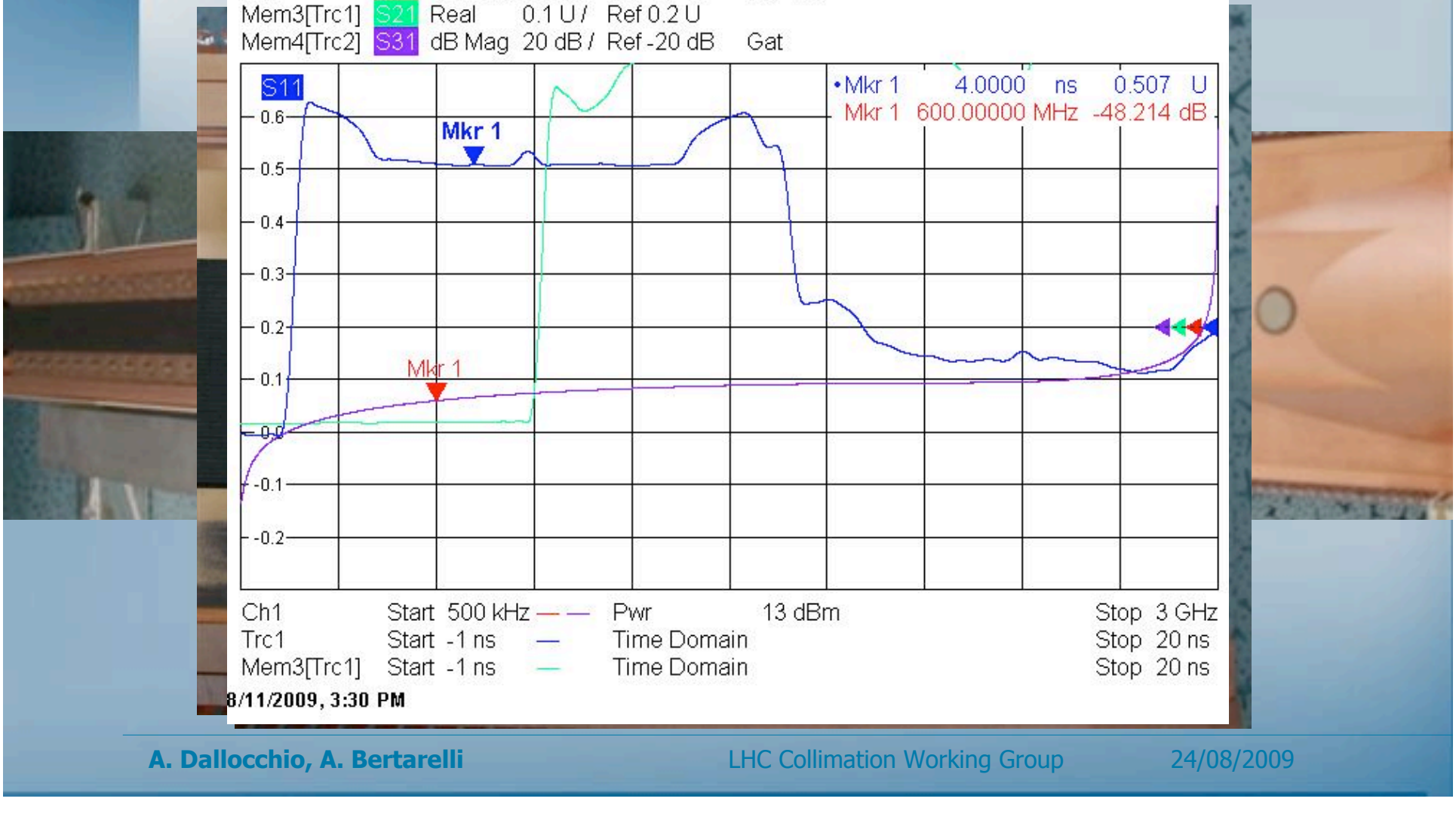
Materials R&D and calculations

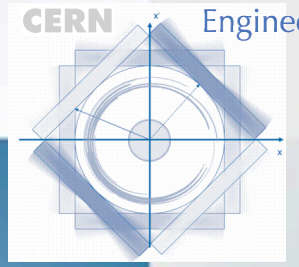
- Cu-CD and SiC samples under characterization.
- Waiting for new FLUKA results for in-depth thermo-mechanical analysis and possible design optimization.
- FP7 collaboration started with Polito and GSI for hydrodynamic simulations.

BPM functional prototype

All pieces produ vered).
Complete ed.







BPM functional prototype

- Preliminary test in the lab. with the wire gave positive results.
- Further tests with motorized jaws will be completed by BE-BI within week 36-37. (Please ask us within the end of this week for any other test required).
- Prototype will be dismounted in week 38 and prepared for future installation in the SPS LSS5 (4-5 week activities in the workshop).
- SPS technical stop of 02-Nov-09 will be exploited by EN-STI to uninstall Proto 1 and install adapted LHC support with vacuum chamber (including cabling and water connection).
  - Waiting for RP green light and availability of VSC group.
  - BE-BI is checking the availability of BPM cables for the SPS.
  - Official documents (ECR…) to be prepared
  - Is a presentation of planned activities necessary at IEFC? (Ralph)