

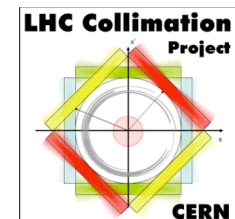
*LOC section meeting  
Geneva, 7 June 2005*

# Trip report from PAC2005



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*CERN AB-ABP*



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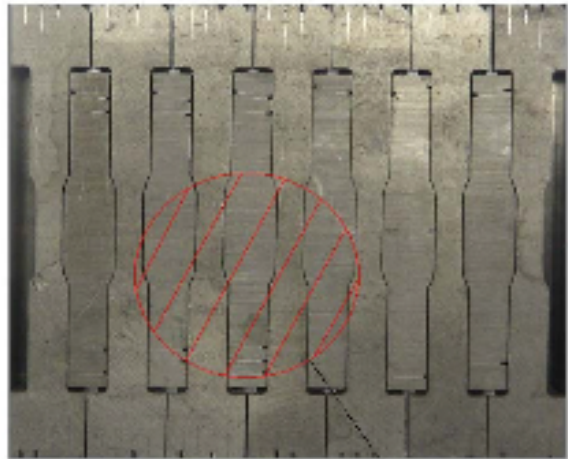
## *General remarks*

- **Big** conference - Difficult to follow interesting presentation:  
2 x 3 parallel sessions (oral + poster)!
- Three open positions at Elettra (IT): RF + accelerator physics  
→ K. Karantzoulis (karantzoulis@elettra.trieste.it)
- PhD in material tests at RHIC for LHC collimator material tests (N. Simos, H. Kirk)

## Contributions of the LHC collimation team

G. Robert-Demolaize <i>et al.</i>	Tracking tool for cleaning inefficiency and beam losses
R. Assmann <i>et al.</i>	Results from prototyping and beam tests
S. Redaelli <i>et al.</i>	Sound/vibration measurements at the TT40 robustness test
A. Bertarelli <i>et al.</i>	Impedance measurements at the SPS
H. Burkhardt <i>et al.</i>	Thermo-mechanical model of the collimator
FLUKA team	Energy deposition studies for IR7
SR-RP team	Radio-protection issues

**H. Kirk et al.:** Post-irradiation properties of candidate materials for high power targets (ROAD003)



Proton Beam Footprint ( $1\sigma$ )

Figure 3: Arrangement of one layer of thermal and tensile test specimens during proton irradiation.

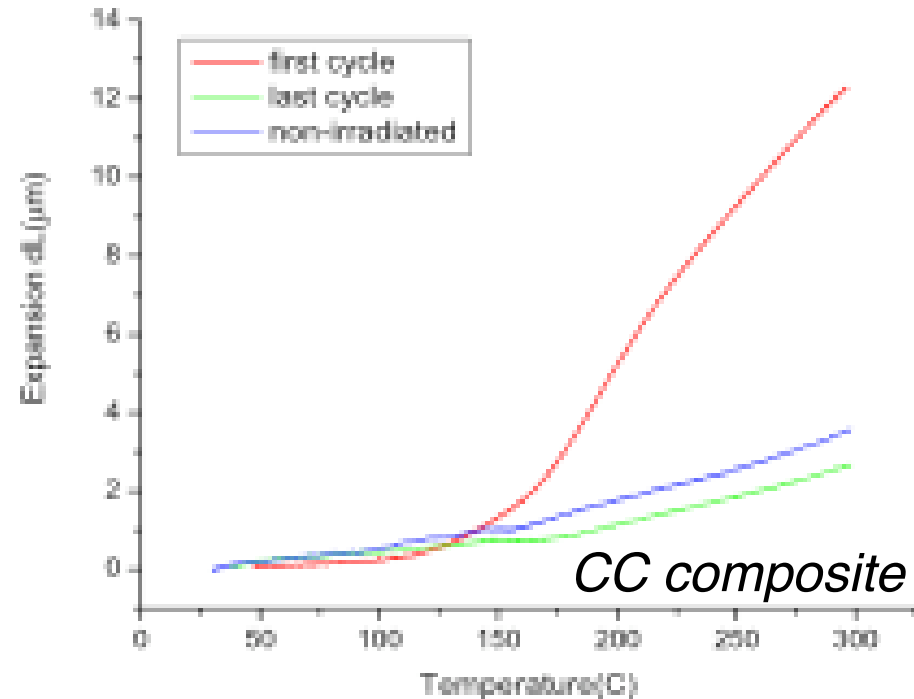


Figure 4: Expansion vs. temperature of CC composites: a) expansion along one of the fiber axes; b) expansion at  $1-r^2$  to the fiber axes.

Irradiated material lose mechanical properties if irradiated (fraction of DPA enough to change expansion coefficient). However, after thermal cycles ( $\Delta T \sim 600^\circ\text{C}$ ) they recover the previous behaviour!

Interesting for the collimator materials! Collaboration already started!

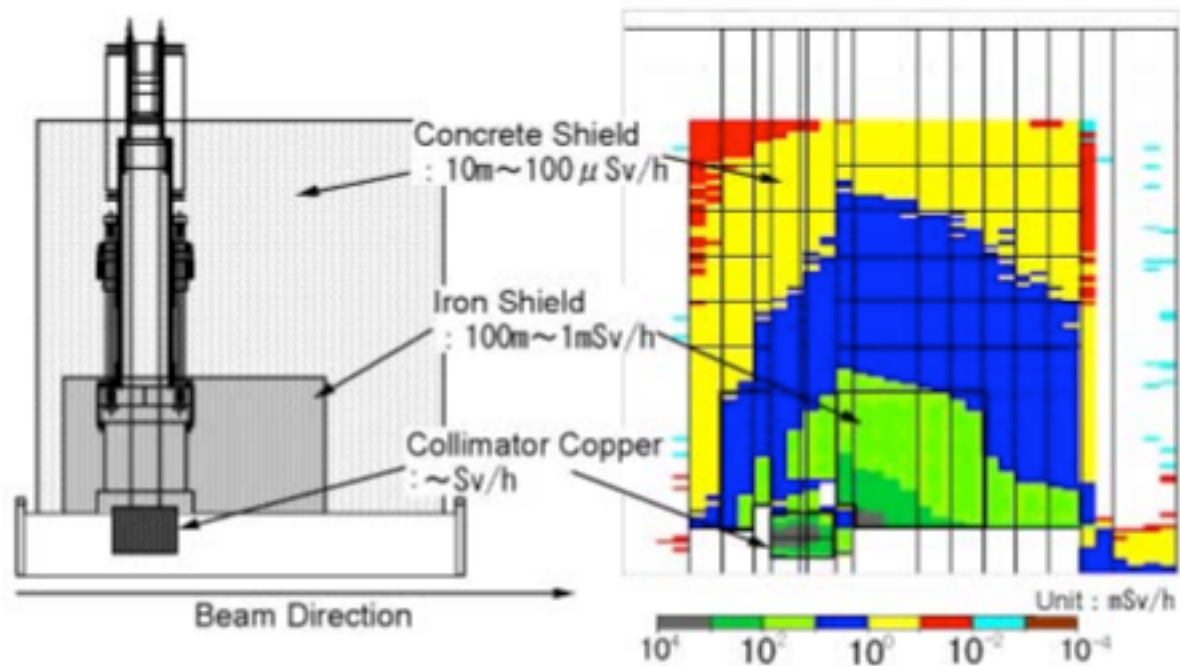
## Collimation studies at the Japan Proton Accelerator Complex (J-PARC)

(3 GeV proton beams; Power  $\sim 1.2$  kW)

K. Yamamoto *et al.*: Development of a collimation system

M. Kinsho *et al.*: Irradiation experiment of collimator key components

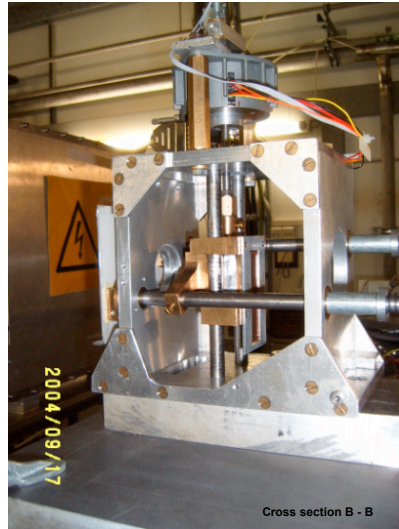
→ Stepping motors that can be operated up to 70 MGy



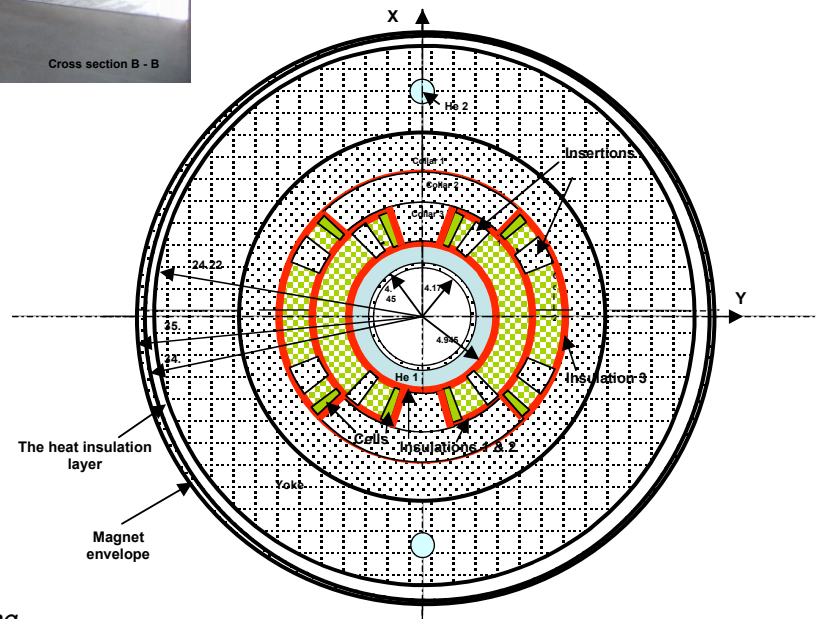
*Strong interest in the design of the LHC collimator for future upgrades!*

## Ion energy deposition studies at GSI (E. Mustafin *et al.*)

- Comparison between measurements and  $^{238}\text{U}$  beam test (RPPE034)
- Radiation damage to the superconducting dipoles (FPAE075)



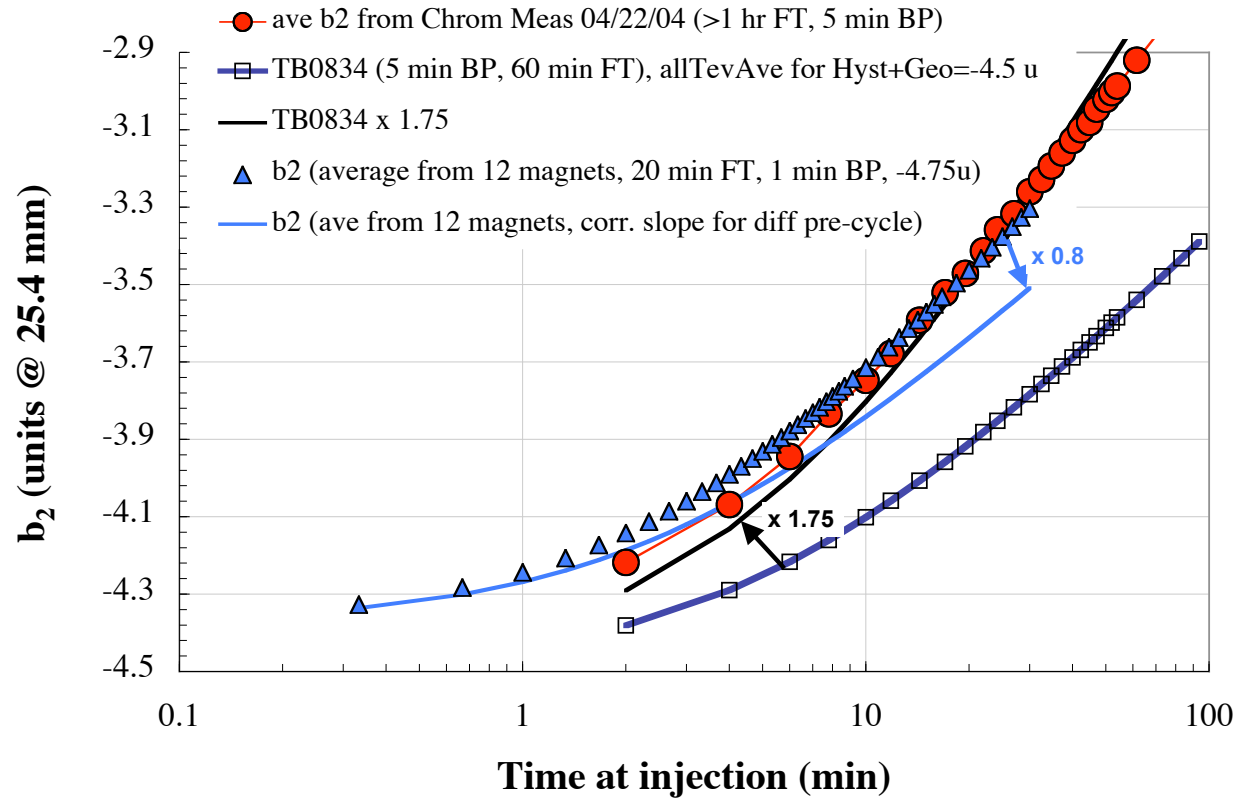
Measurement & Codes	Range, mm			
	Fe, 500	Cu, 500	Fe, 950	Cu, 950
Measurement	5.9±0.2	5.3±0.2	14.3±0.4	12.8±0.4
ATIMA	6.1	5.4	14.7	13.4
SRIM	6.5	5.9	16.1	15.2
SHIELD	5.9	5.4	15.1	14.1



Detailed comparisons with estimated quench limits and lifetime of various components

Interest for LHC ion team?

**P. Bauer *et al.*:** Advancing in the understanding and operations of superconducting colliders (MOPA001)



- Comprehensive description of experimental results on dynamic effects
- Dynamics behaviour of magnets can be argued from beam measurements?
- Argued that this would not be possible for the LHC - less measurements on magnets

## Other highlights

- F. Pilat                      Non-linear optics corrections at RHIC
- P. McIntyre                Tripler upgrade for the LHC  
Conceptual design of a *24 T hybrid dipole* for the LHC!
- ILC activities              Formal organization targeted at preparing a technical  
design report by 2008
- B. Parker                    Development of superconducting final focus quadrupoles  
for future linear collides
- Light source                Section dedicated to worldwide proliferation of light  
sources (Australia, Shangai, Taiwan, Brazil, Turkey, ...)