

Results from the
Workshop on Field Quality Steering of
the Dipole Production
'03

Hot topics (amongst others):

- Steering of the magnetic length
- Correction of the coil X-section

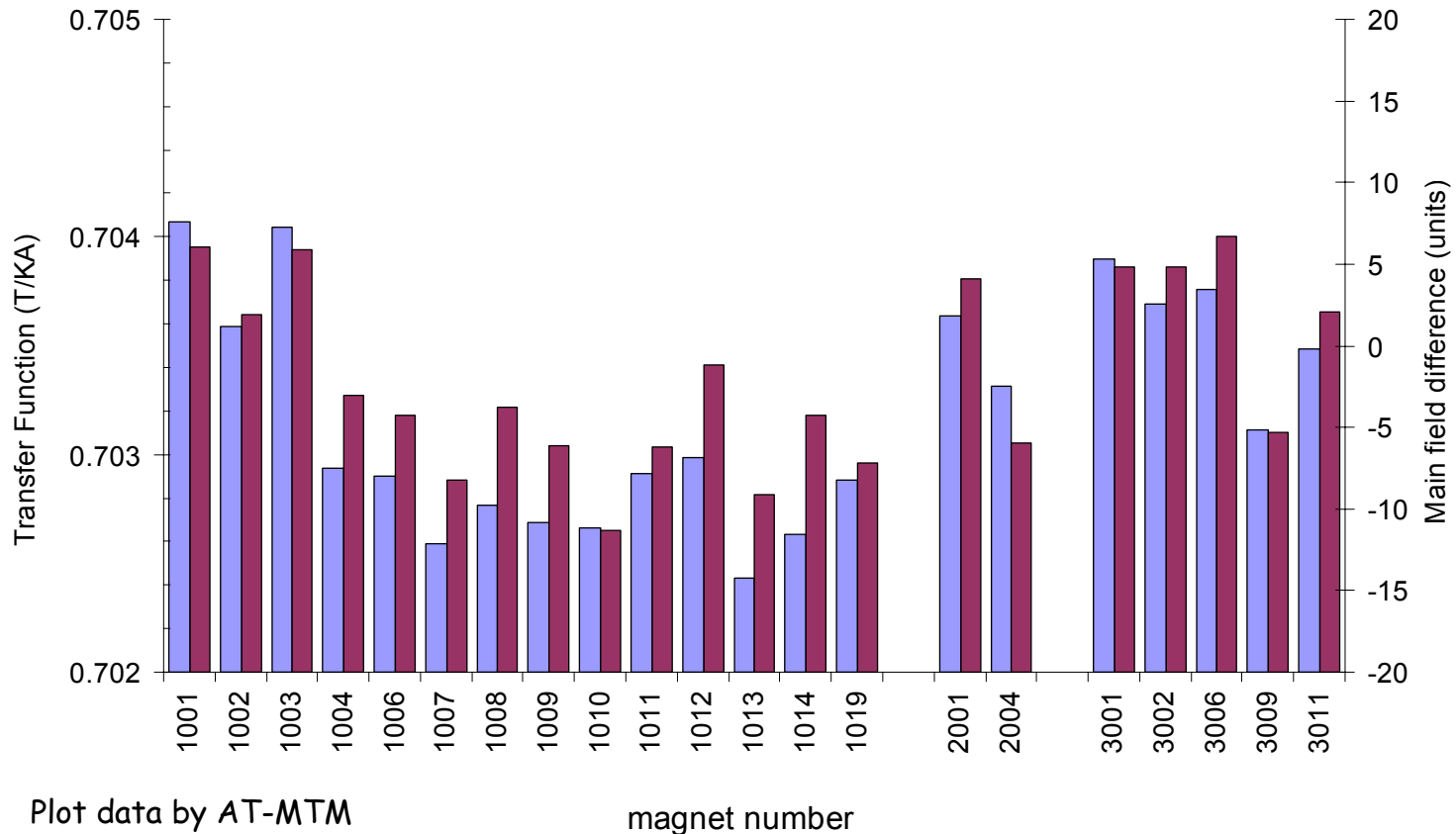
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Values and Steering of the Magnetic Length

- Comparison between Noell and Alstom collared coils (tested at cold) shows approx. 10.5 units higher B1 for Noell.
- This data is confirmed by 7.5 units which are seen for the cryomagnets.
- In addition an increase of the difference in the averages is still observed for the last 15 CCs (five per firm) up to 17 units.



B1 Measured for Cryomagnets



Values and Steering of the Magnetic Length

- Comparison between Noell and Alstom collared coils shows approx. 10.5 units higher B1 for Noell.
 - This data is confirmed by 7.5 units which are seen for the cryomagnets.
 - In addition an increase of the difference in the averages is still observed for the last 15 CCs (five per firm) up to 17 units.
- ⇒ Although little statistics exist, an adjustment of the end laminations (100 mm) for all manufacturers should be taken.
- ⇒ This measure is not cost-intensive and can be reversed in case further cryo-measurements do not support the decision.



Correction of the Dipole X-section

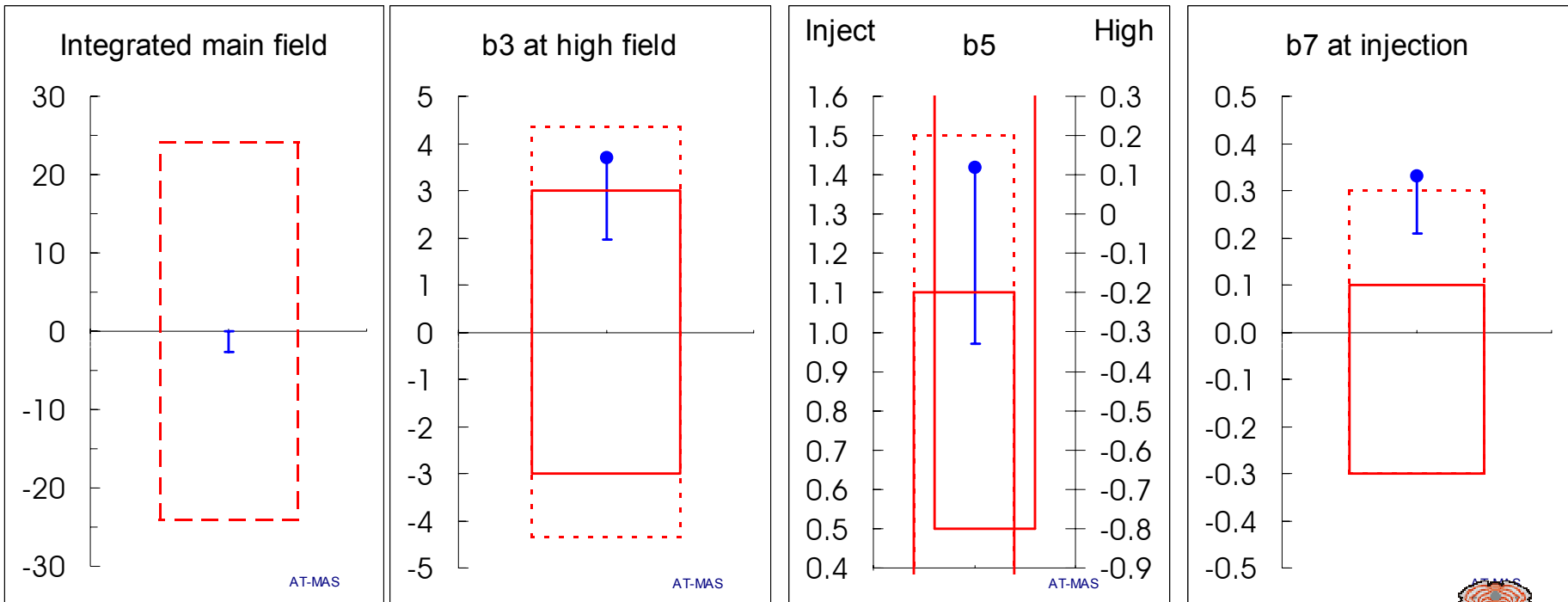
- Various proposals have been given in order to bring the lower order odd multipoles towards the beam dynamics target.
- In the discussion, it was concluded to increase the thickness of the midplane insulation by 0.10 mm on both layers.
- **Expected improvements at nominal field:**
 $\Delta b_3 = -1.8$ units $\Delta b_5 = -0.45$ units $\Delta b_7 = -0.12$ units
- In the case that an additional adjustment is necessary on multipole b_3 , the polar shim can be reduced by 0.05 mm on both layers.
 \Rightarrow expected improvement at nominal field $\Delta b_3 = -1.2$ units (w.r.t. the previous solution), little effects on b_5 , b_7



Corrective actions: odd normal multipoles

- Solution 4: 0.10 mm more in midplane (inner&outer layer)
 - Small pre-stress variation of 6 MPa (± 15 MPa is the specification)
 - $\Delta b3 = -1.8$ units - this brings b3 at around 2 units at high field
 - $\Delta b5 = -0.45$ units
 - $\Delta b7 = -0.12$ units

margin on b3 and b5, better b7



Remark to Cost-considerations:

- standard thicknesses of the insulation exist, which are 50 μm , 75 μm , 125 μm .
- the use of 125 μm together with a reduction of the polar shim by 0.05 mm results in **expected improvements at nominal field:**
 $\Delta b3 = -3.45$ units $\Delta b5 = -0.3$ units $\Delta b7 = -0.15$ units.



Magnetic Length of the Measured Cryodipoles

