MBI Re-Mapping Status

Review of:

- Total $\int_L B \cdot dl$ Residuals
  - ISR Residuals
  - 2001 Residuals
  - 2001 Residuals (fit to the ISR calibration)

New results/plots:

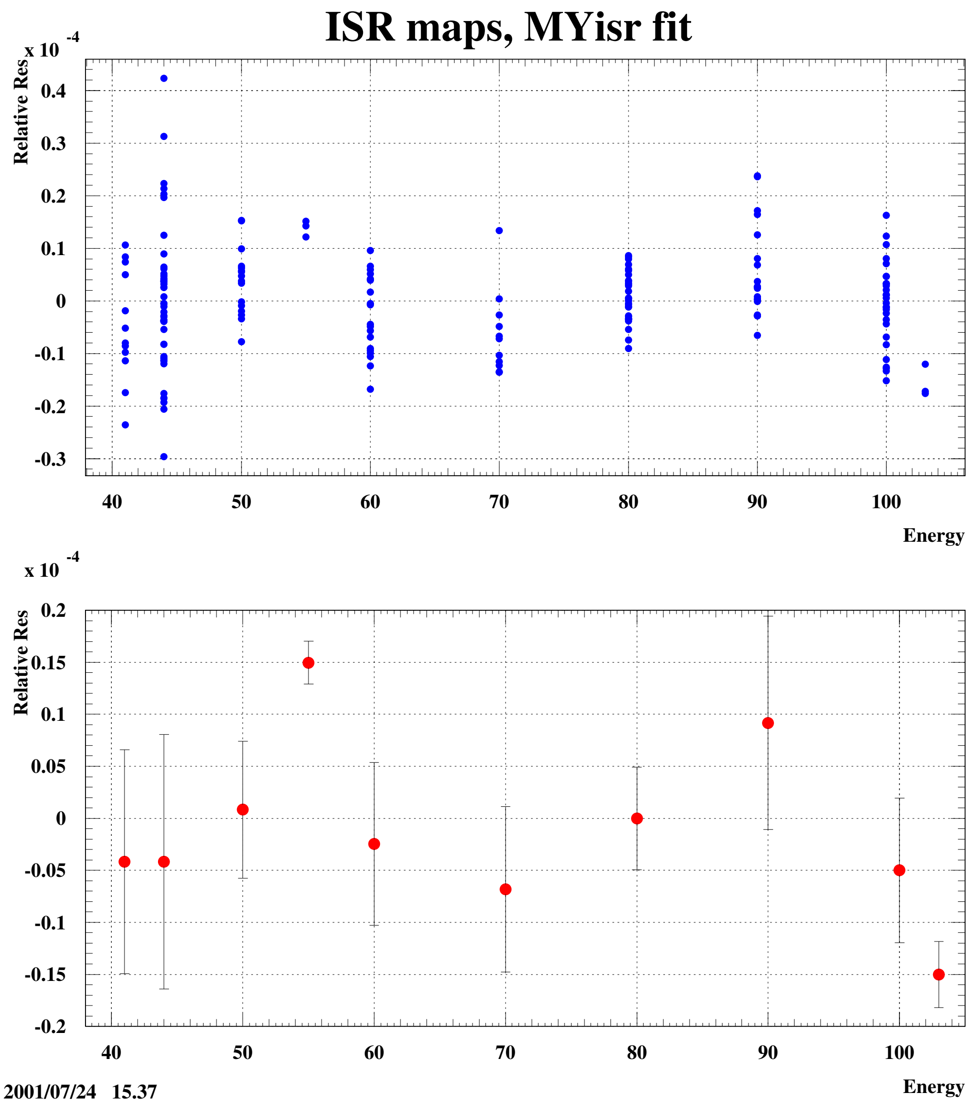
- Local Endfield Differences
- Ratios Residuals
- Reference Probes relative differences
- Horizontal Field Scan (missing): the idea is to map the horizontal component of the field by mean of the Hall probes, after tilting them of 90 degrees. The field should be $\approx 10^{-3}$ of the vertical component, threfore a precise positioning of the probes is needed.

What remains to do?

- Collect everything and write a note...

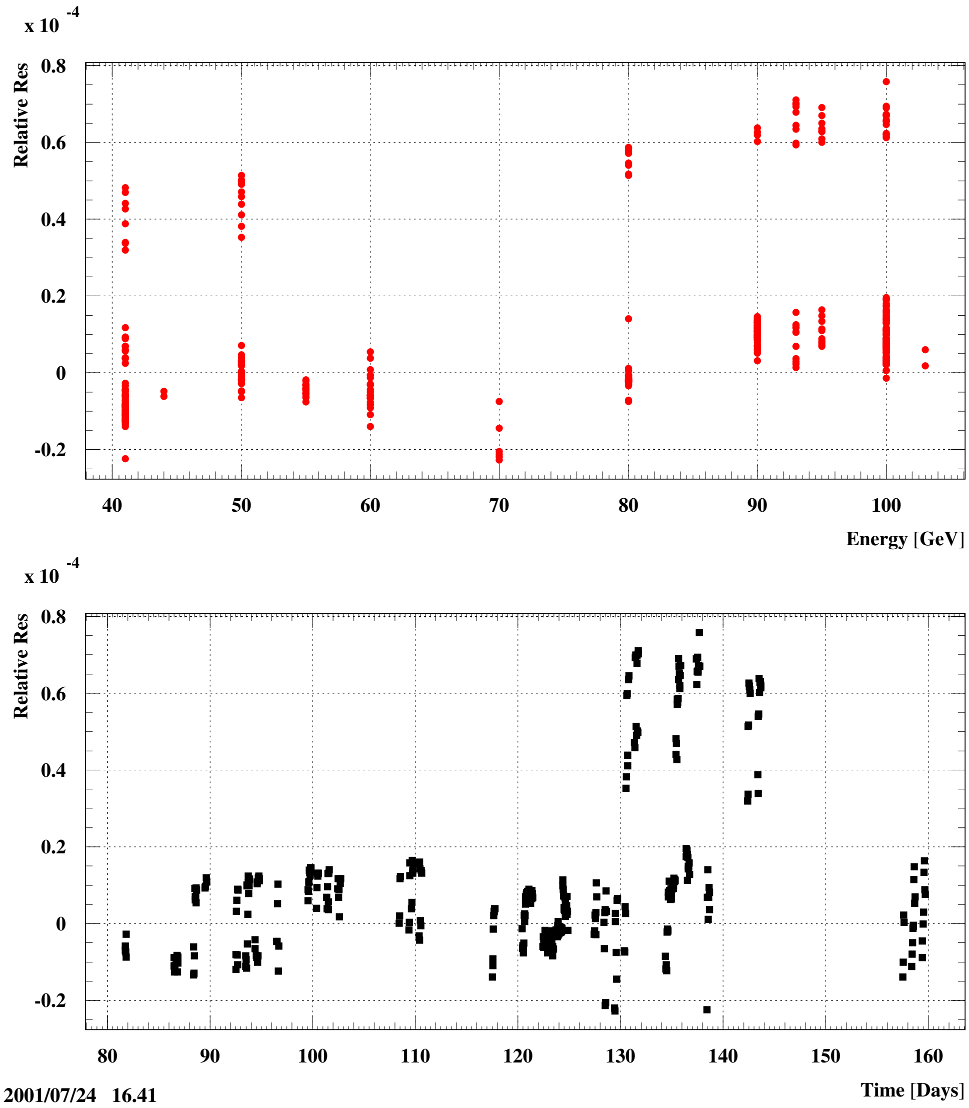
ISR Residuals

Results of the ISR mapping campaign, residuals calculated taking as references only Type1 NMR probes at low energies and only Type2 at high energies (better fitting with the 2001 configuration)



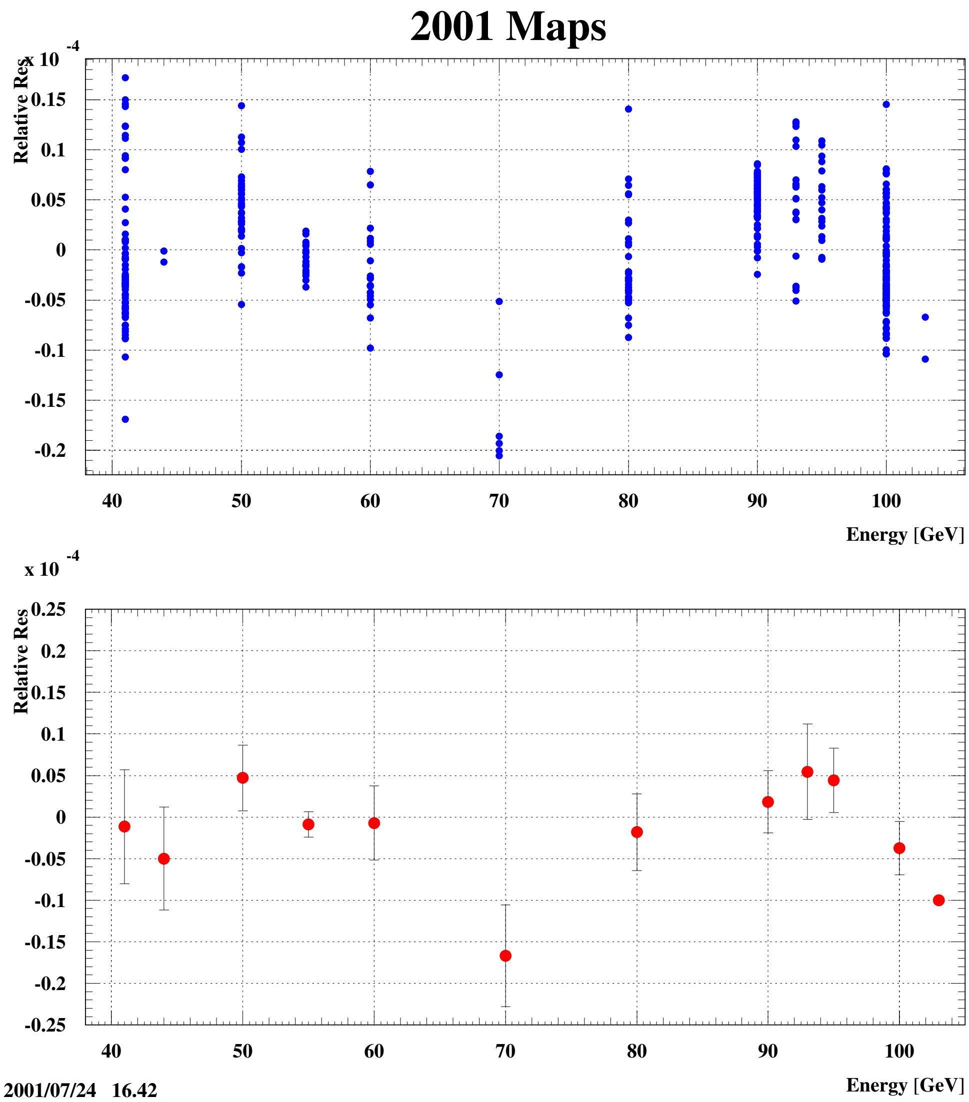
2001 Residuals I

Results of the 2001 mapping campaign, fit performed including 420 maps, no temperature correction applied.

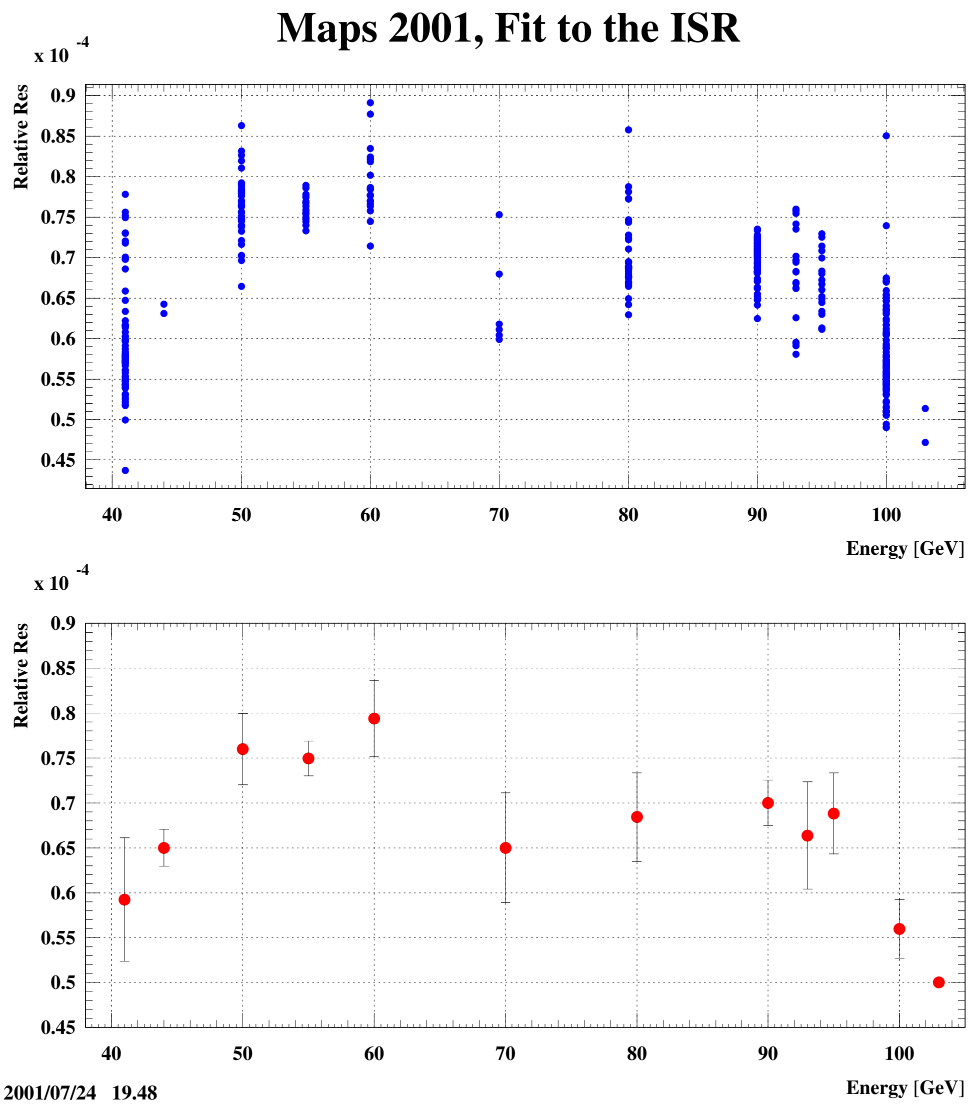


2001 Residuals II

Results of the 2001 mapping campaign after the temperature correction. As for the ISR the coil average temperature during the map periods is taken as significant for the normalization. Temperature coefficients for the core and for the end field have been calculated and they fit with the ISR ones: $C_T^{core} \approx -8 \cdot 10^{-6}$, $C_T^{end} \approx 7.8 \cdot 10^{-5}$

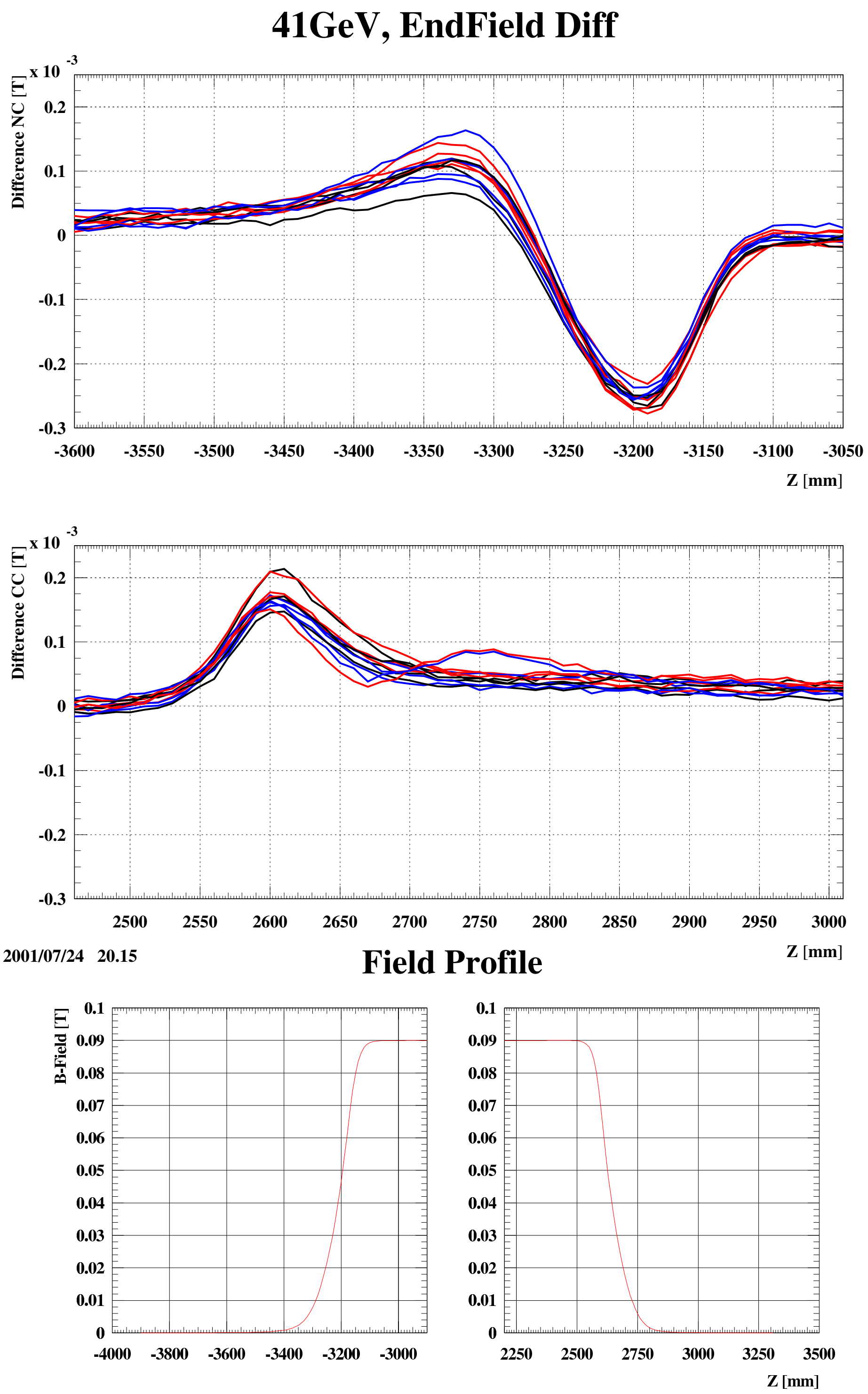


2001 Residuals vs ISR

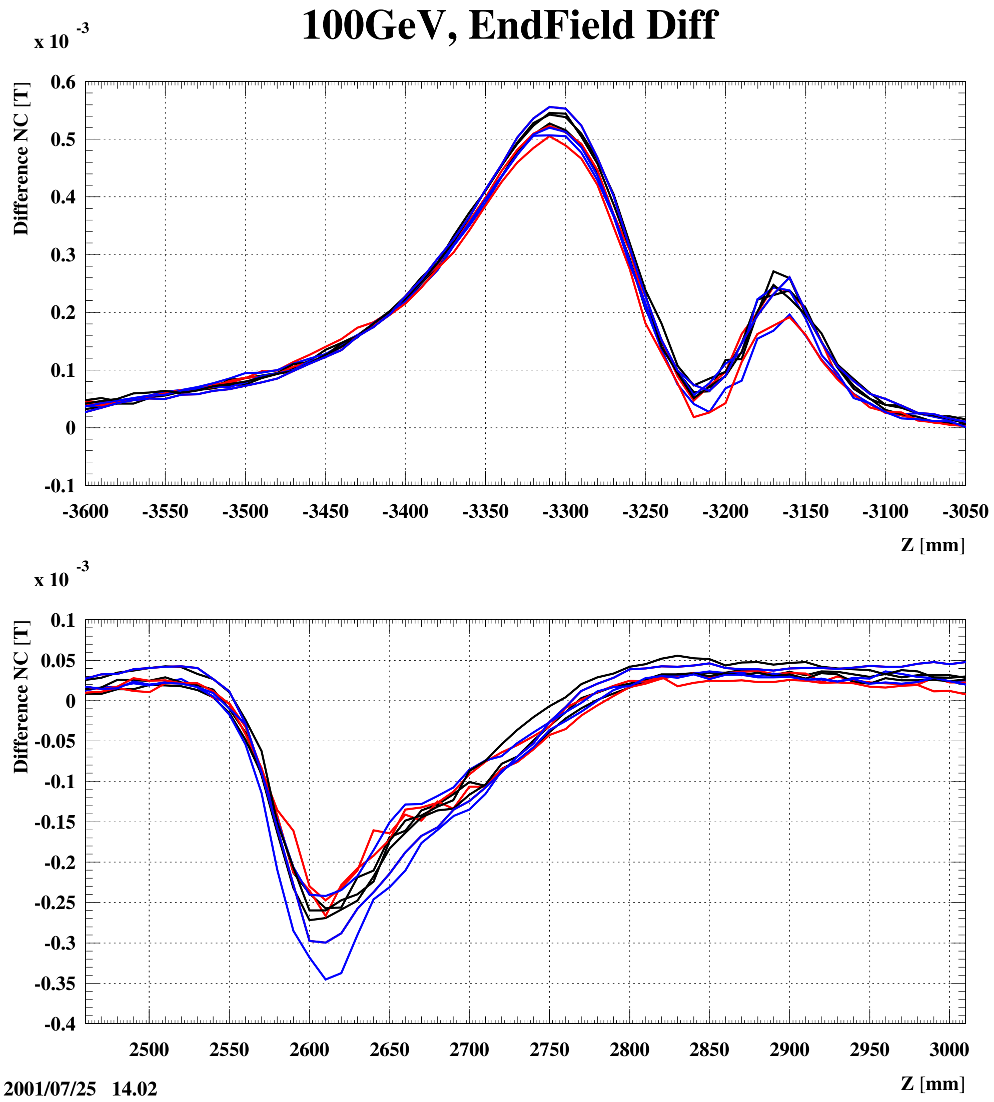


Local Endfield I

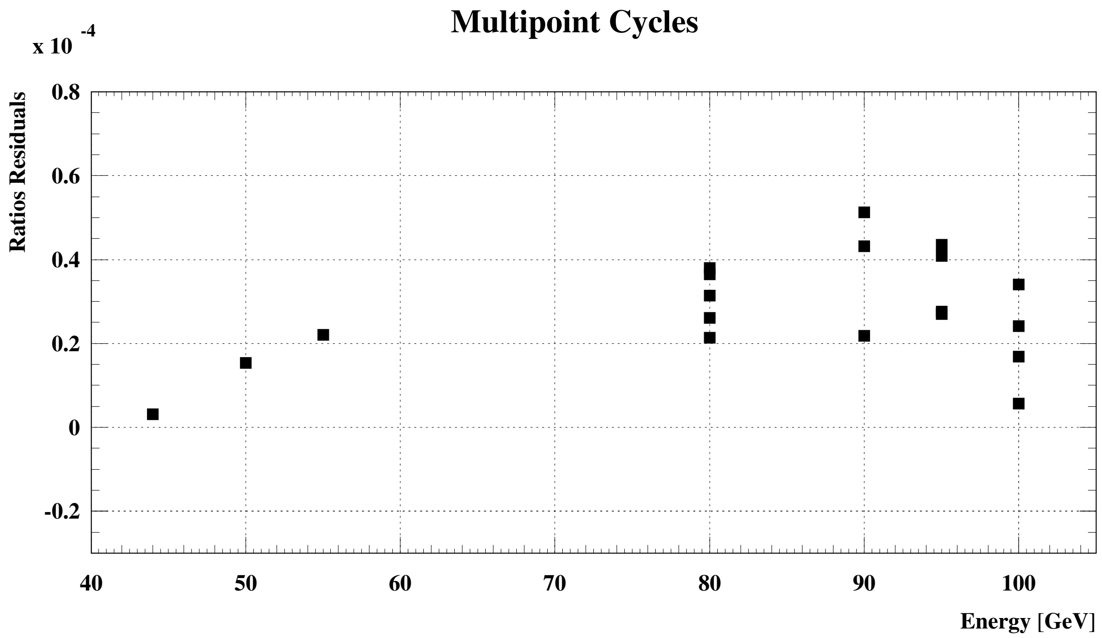
Zooming on the edfields and plotting the differences (ISR-2001), it's evident a systematic difference in the field profile. The plots show a number of randomly takend ISR/2001 maps, at 41 GeV and 100 GeV. The integral of the difference corresponds to the relative difference in the total $\int_L B \cdot dl$



Local Endfield II



Ratios



A number of "multipoint cycles" has been performed, the plot shows the quantity:

$$\frac{\int_L B \cdot dl_{E_2}}{\int_L B \cdot dl_{E_1}} - \frac{\int_L B \cdot dl_{E_2}(predicted)}{\int_L B \cdot dl_{E_1}(predicted)}$$

in which the $\int_L B \cdot dl$ prediction is done reading the reference probes during the 2001 maps and predicting the integral by mean of the ISR calibration.
E_1 is always 41.6 GeV, E_2 is the value on the x-axis.

Reference NMR Probes

Here is a comparison of the relative difference between the 4 reference probes as function of energy, in the ISR, in the tunnel during the 2000 run and in during the 2001 measurements in the laboratory: