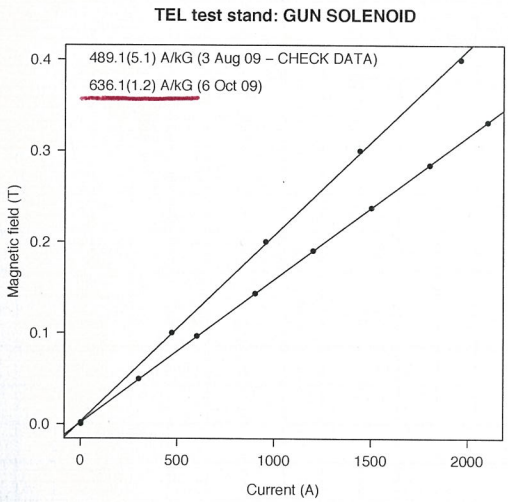
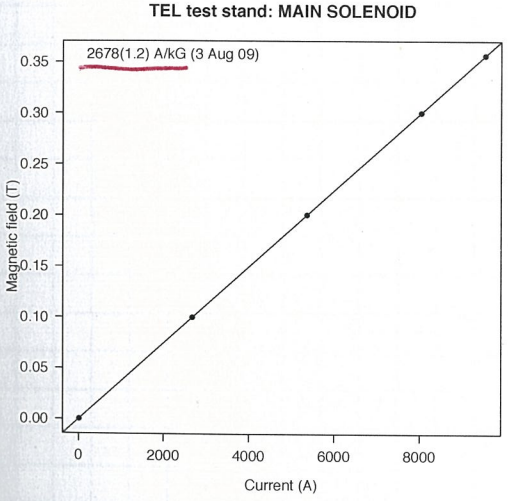
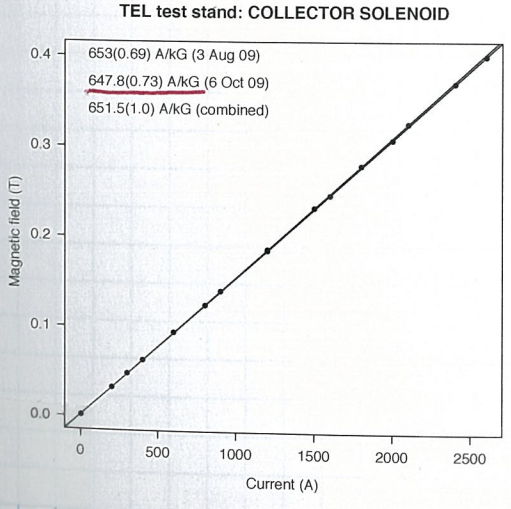
30 DEC 09 B-field calibration in TEL test stand

Data from 3 Aug 09 (#11, p. 106) and 6 Oct 09 (#11, p. 139)







These calibration constants are to be compared with the ones from the PAC99 papers:

gun/collector: $\frac{(2700\ A)}{(4\ kG)} = 675\ A/kG$

main: $\frac{(10\ kA)}{(4\ kG)} = 2500\ A/kG$

The theoretical field in the middle of a solenoid of length L and inner diameter D is

$$B_0 = \mu_0 \frac{N}{L} I \frac{L}{\sqrt{L^2 + D^2}}$$

For the main solenoid

$$\text{main}: \frac{I}{B_0} = \frac{\sqrt{(192\ cm)^2 + (20\ cm)^2}}{(192\ cm)} \cdot \frac{(192\ cm)}{(64)(4\pi \times 10^{-7}\ \frac{H}{m})}$$

$\sqrt{(192\ cm)^2 + (20\ cm)^2} = 1.005$

$= 2400\ A/kG$ into account

probably 64, taking ferromagnetic yoke

How many turns in gun and collector?

$N = 72$? ($\Rightarrow I/B_0 = 633\ A/kG$)

Inner diameter: 28 cm; length: 50 cm