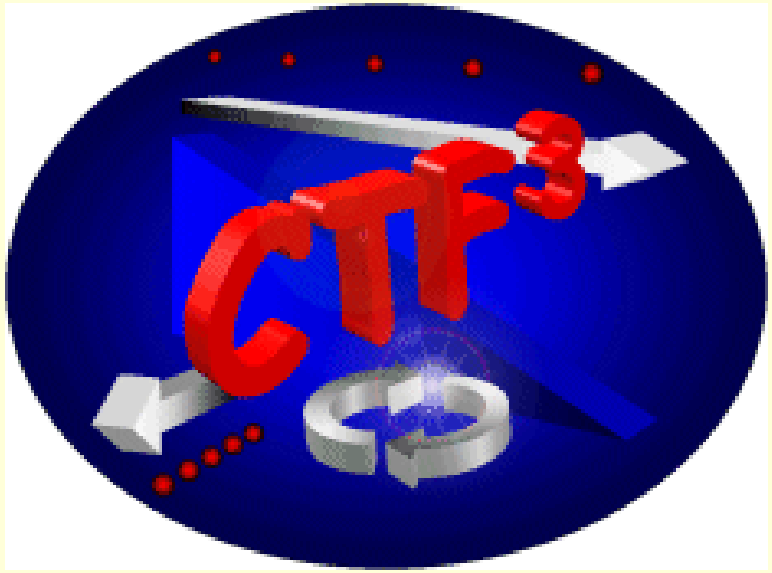


Intensity and Position Monitors.

Intensity and Position monitors

Electrostatic PU's (BPE)

Inductive PU's (BPM)

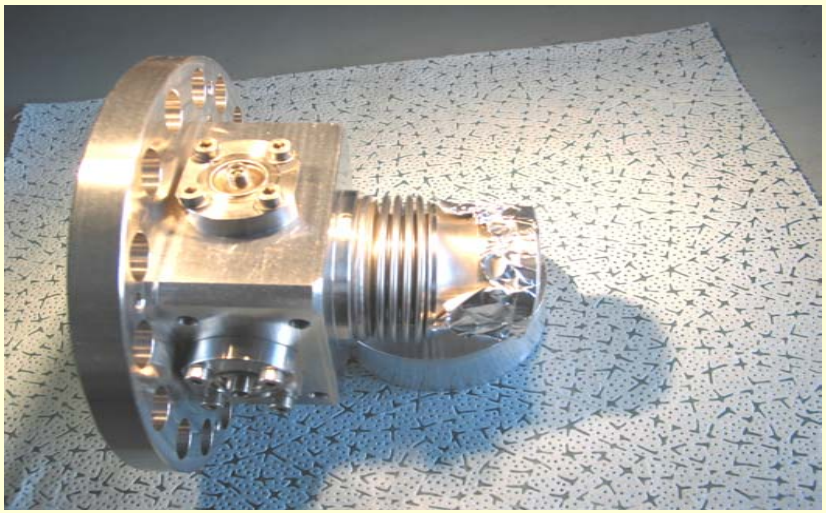
} Low frequency

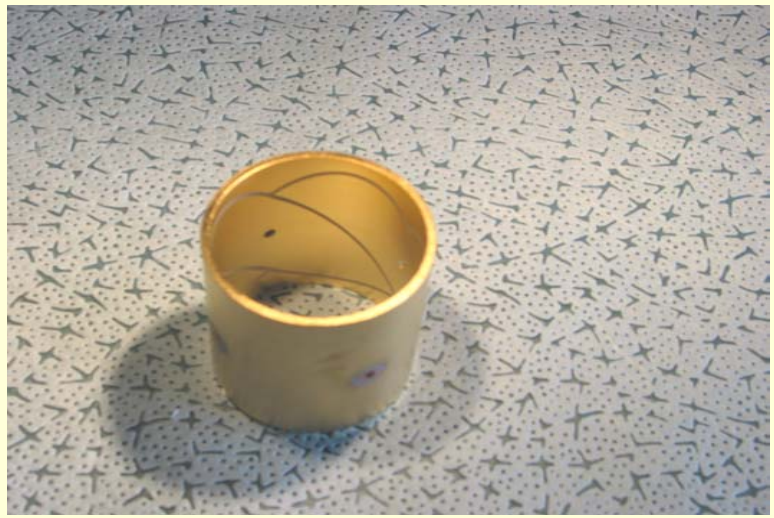
Button PU's (BPR)

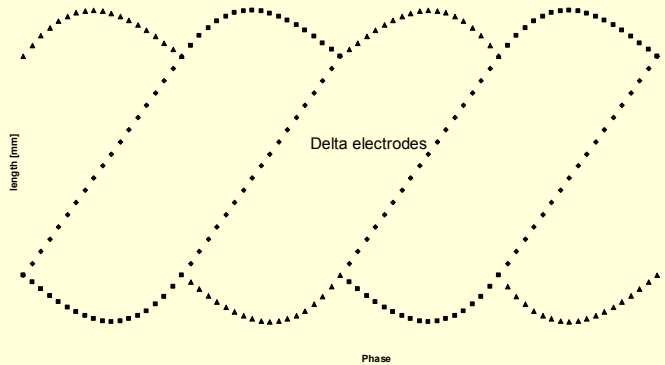
Wall Current Monitors (WCM)

} High frequency

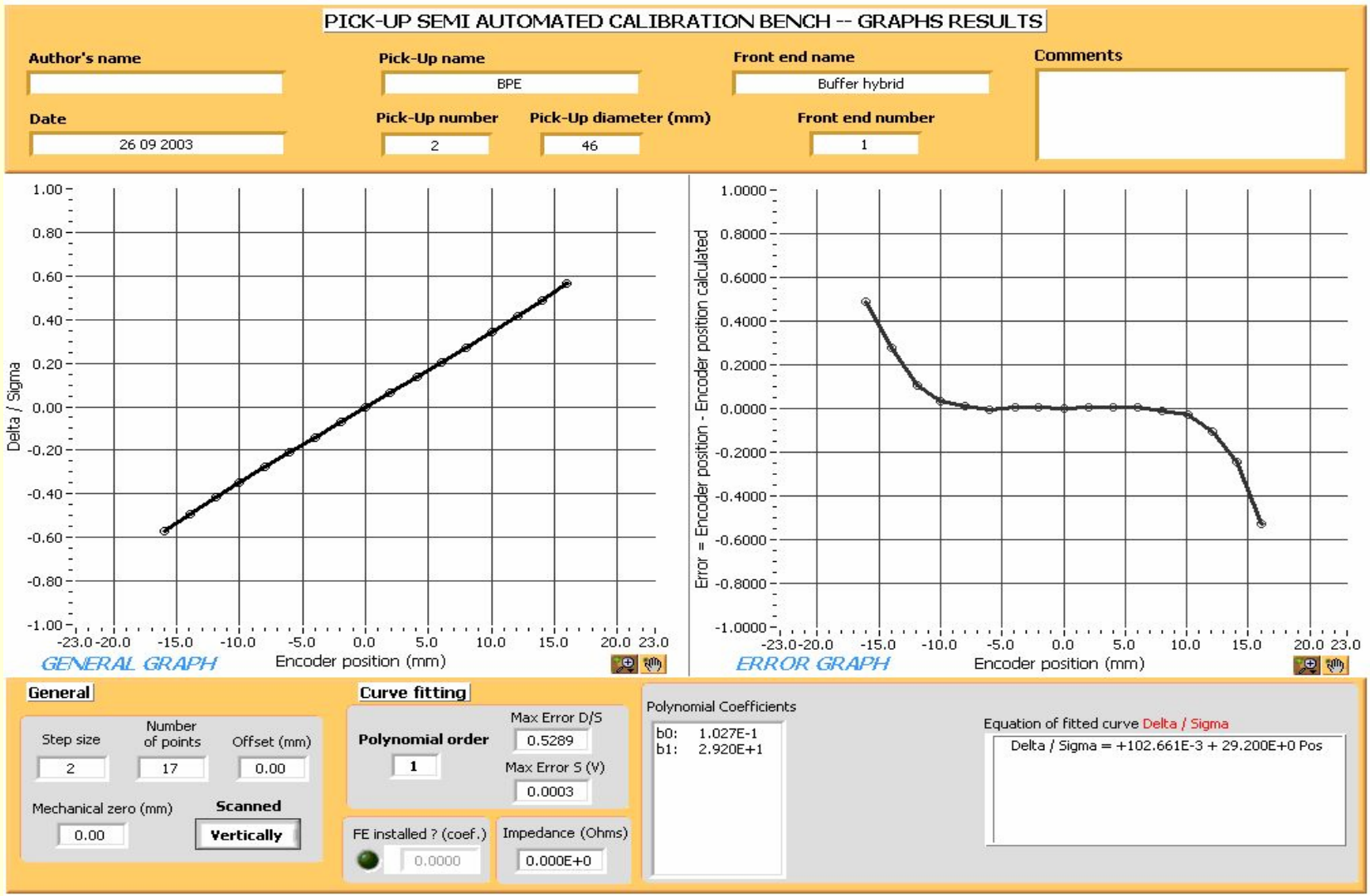
Electrostatic PU



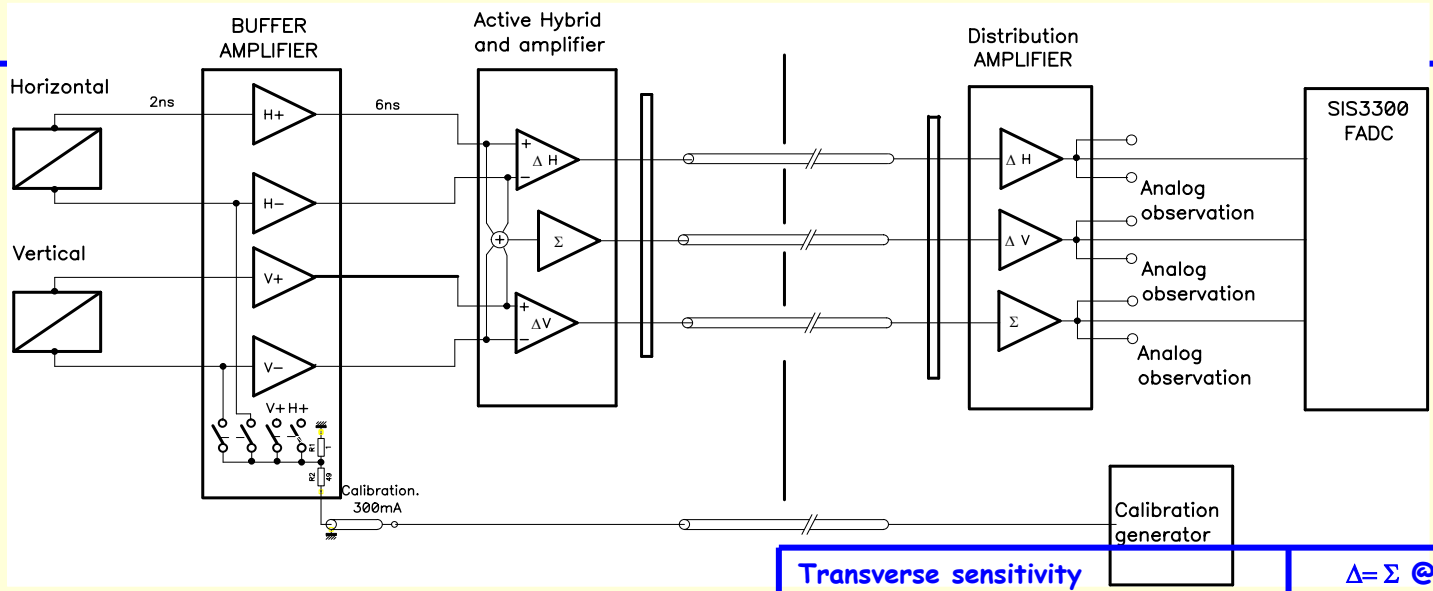


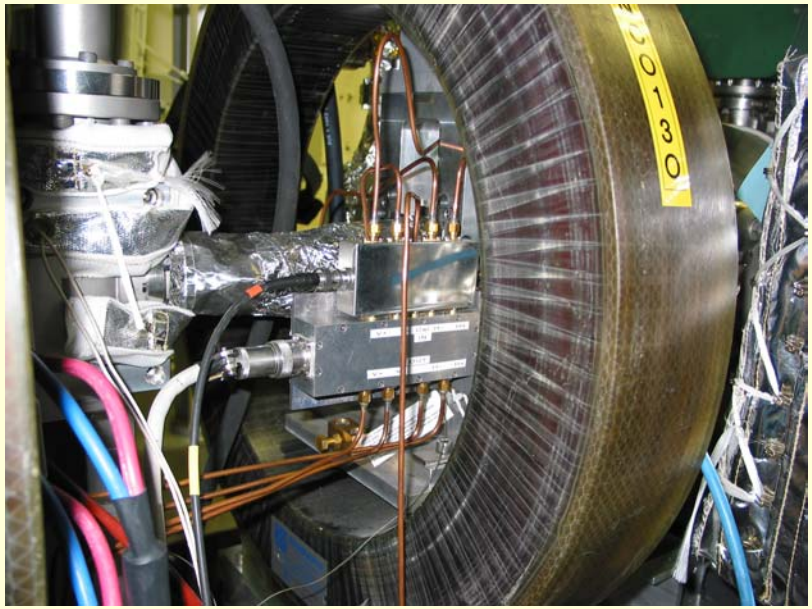


Electrostatic PU



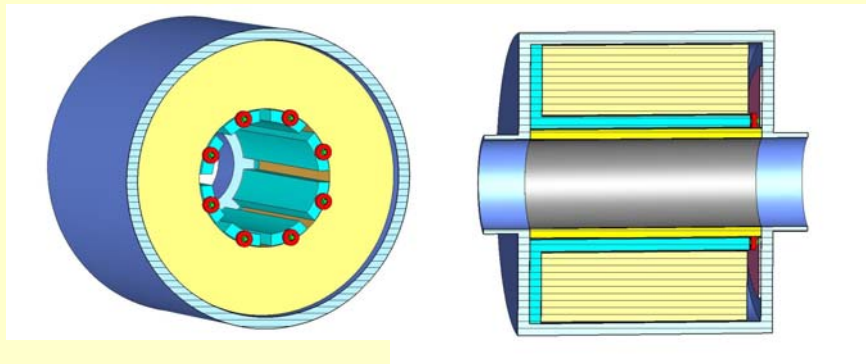
Electrostatic PU

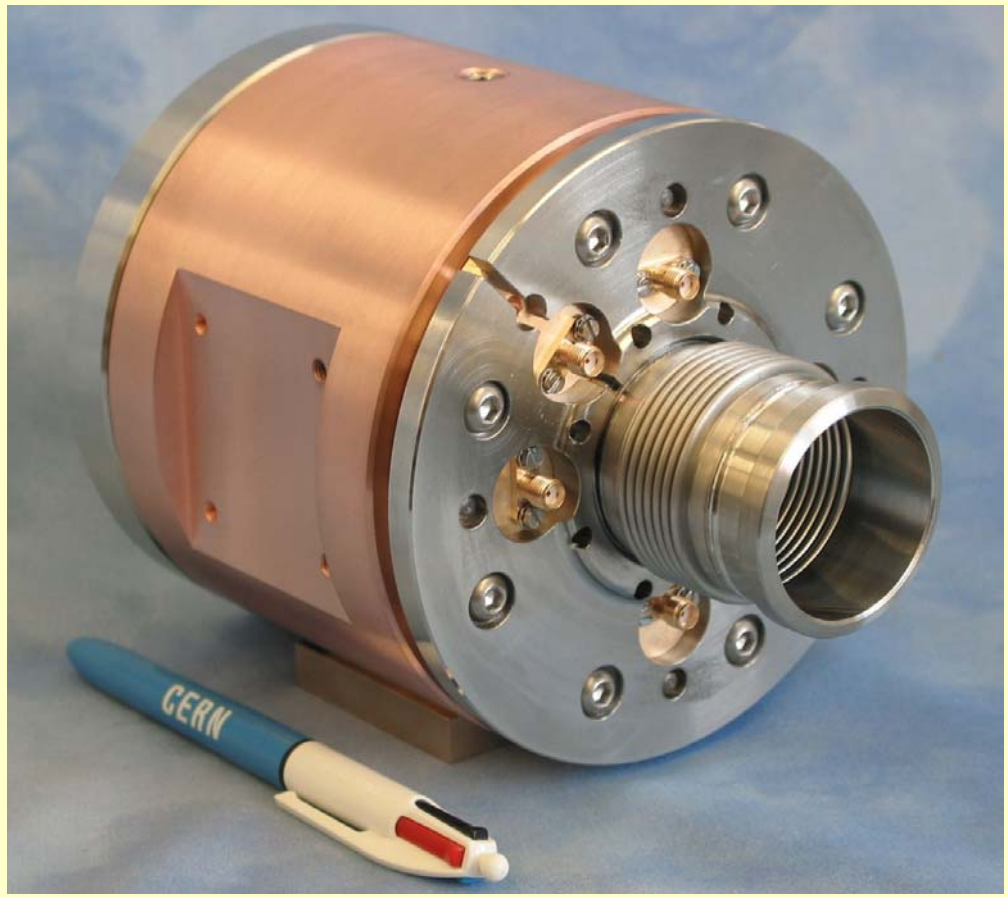




Transverse sensitivity	Δ=Σ @ ~10mm
Resolution	10um /20um
Relative precision (±10mm)	0.2%
Longitudinal coupling impedance	0.17 / 1.7 ohm
Resolution	12mA / 1.2mA
Absolute precision (I)	~ 1%
Low frequency cut off	1kHz
High frequency cut off	200MHz
Calibration	Yes
ID / Length	46mm / 130mm
Number of feedthroughs	4
Flange types	DN40CF / DN100CF
Max. bake-out temperature	130 °C

Inductive Pick-Up New Design



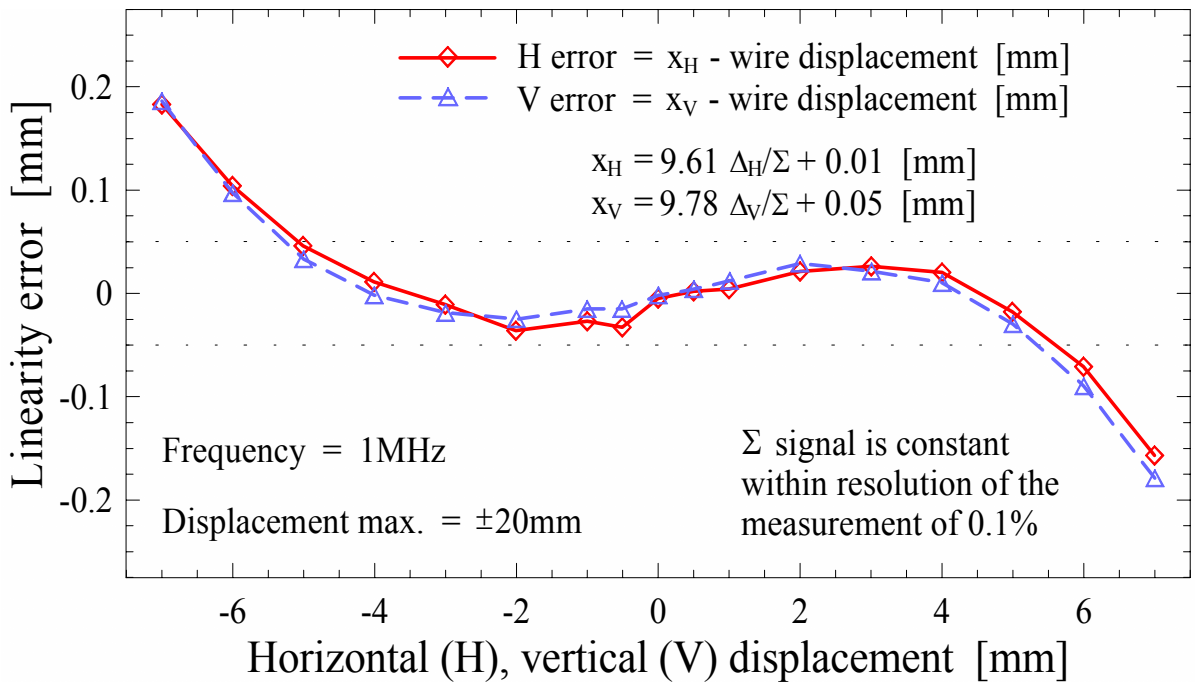


- The ceramic tube is coated with low resistance titanium layer, resistance: end-to-end ≈10 Ω, i.e. ≈ 15 Ω/□
- Primary circuit has to have small parasitic resistances (Cu pieces, CuBe screws, gold plating)
- Tight design, potential cavities dumped with the ferrite
- The transformers are mounted on a PCB and connected by pieces of microstrip lines (minimizing series inductances)

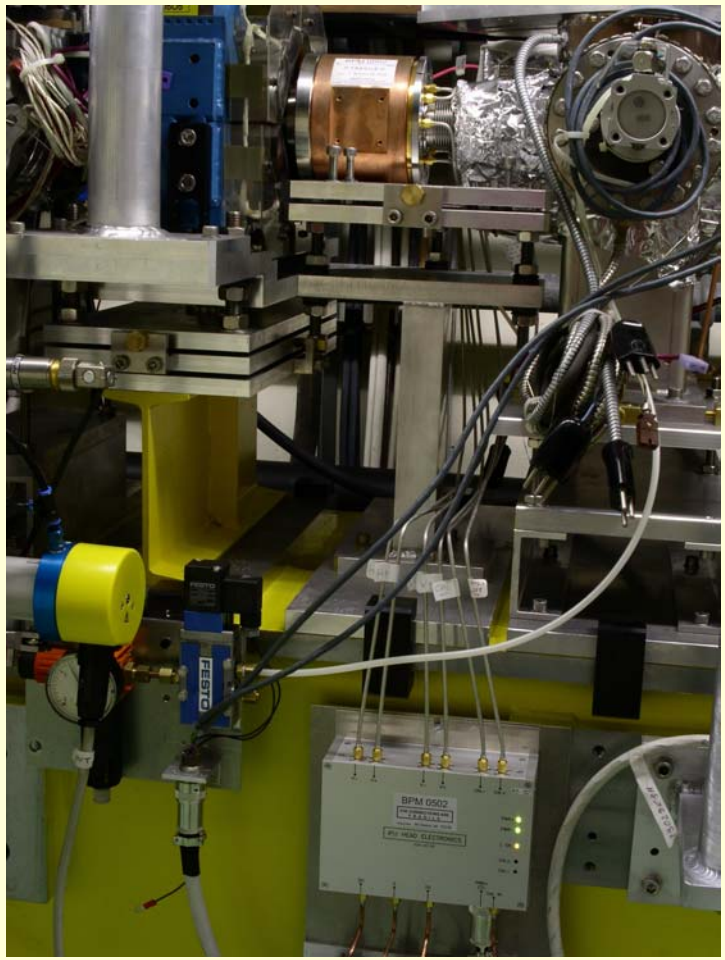
$$\text{horizontal position} = 9.61\frac{\Delta_H}{\Sigma} + 0.01 \ \text{[mm]}$$

$$\text{vertical position} = 9.78\frac{\Delta_V}{\Sigma} + 0.05 \ \text{[mm]}$$

A thin wire forming a coaxial line was displaced diagonally across the pick-up aperture.
The measurement was done with a network analyzer: signal was applied to the wire and hybrid signals were observed.

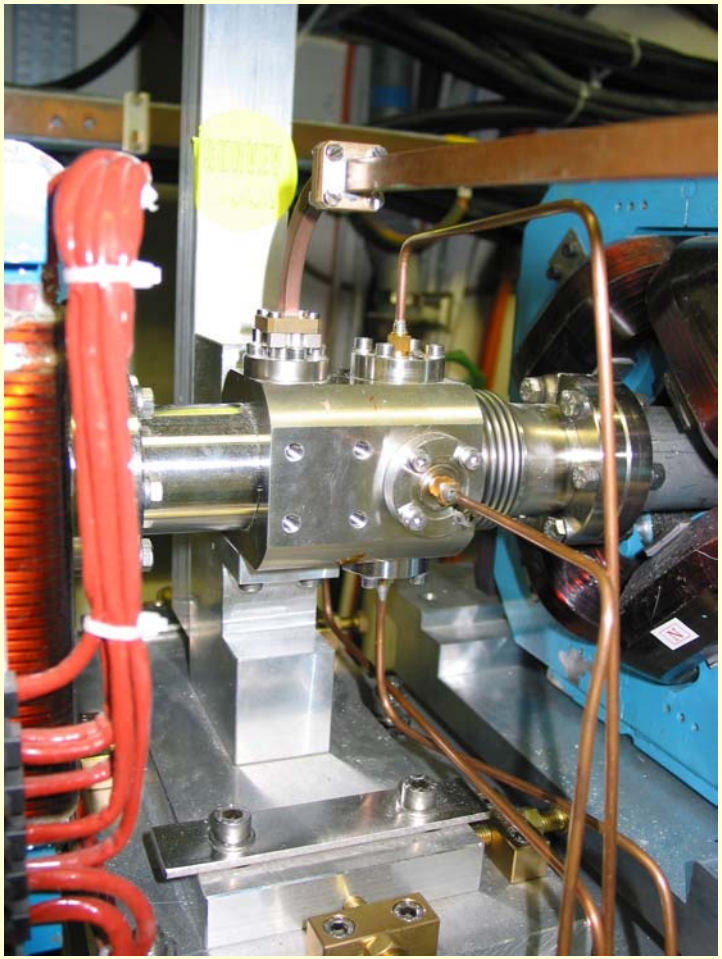


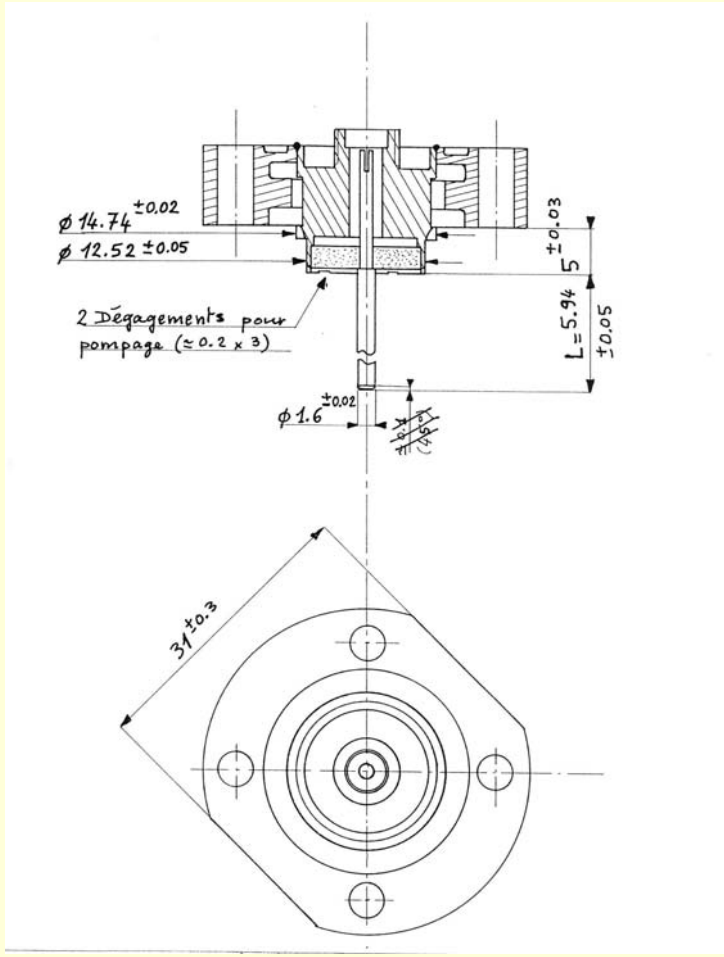
Inductive PU (M. Gasior)



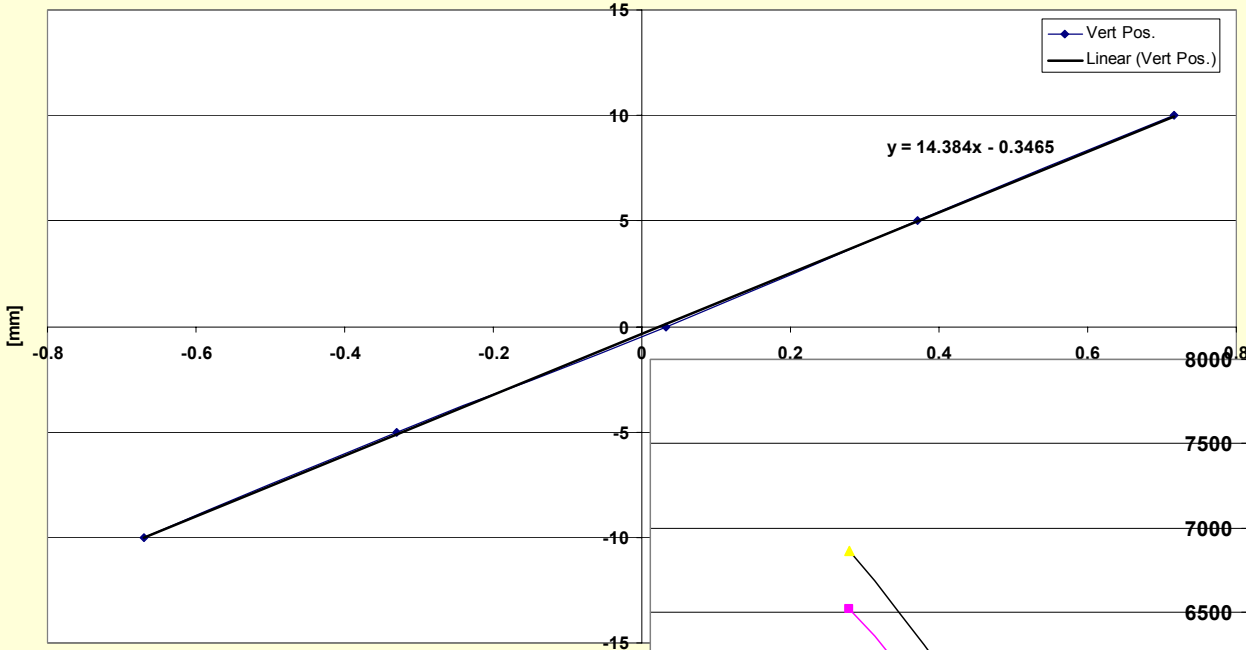
Transverse sensitivity	$\Delta = \Sigma$ @ ~10mm
Resolution	10um / 50um
Relative precision (±5mm)	1%
Longitudinal coupling impedance	0.1 / 1 ohm
Resolution	6mA / 3mA
Absolute precision [I]	~ 1%
Low frequency cut off	1kHz
High frequency cut off	200MHz
Calibration	Yes
ID / Length	40mm / 168mm
Number of feedthroughs	0
Flange types	DN40CF
Max. bake-out temperature	130 °C

Button PU

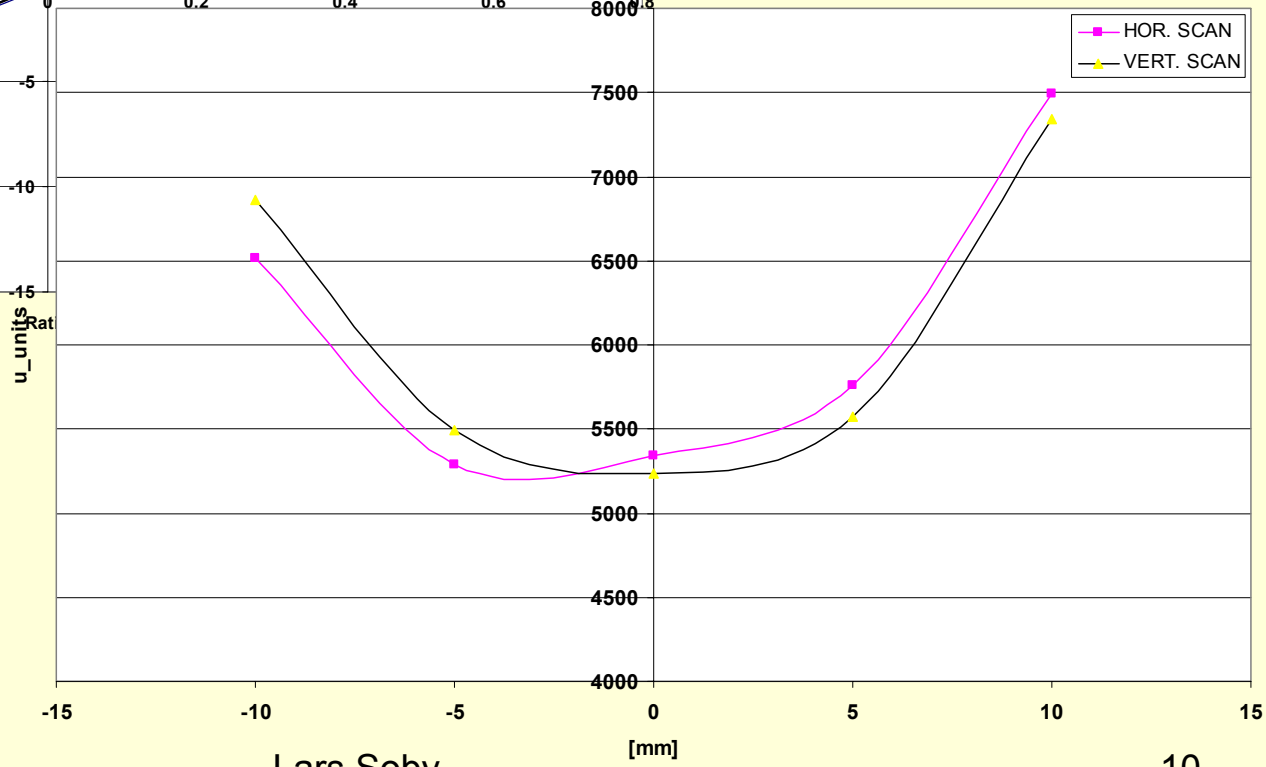



ø 14.74 ±0.02
ø 12.52 ±0.05
2 Dégagements pour pompage (≈ 0.2 x 3)
5 ±0.03
L=5.94 ±0.05
ø 1.6 ±0.02
31 ±0.3

Button PU

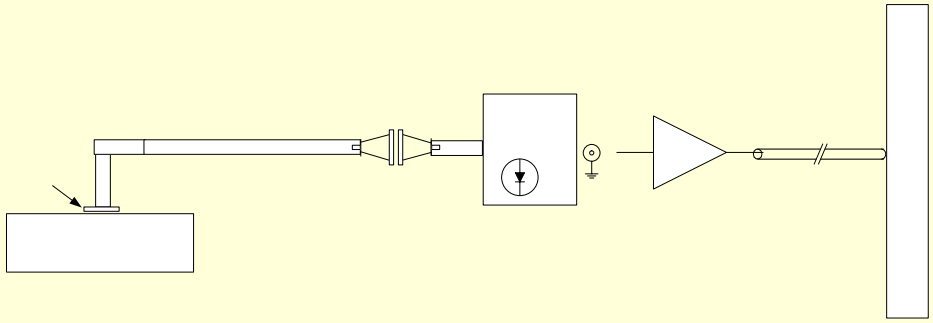


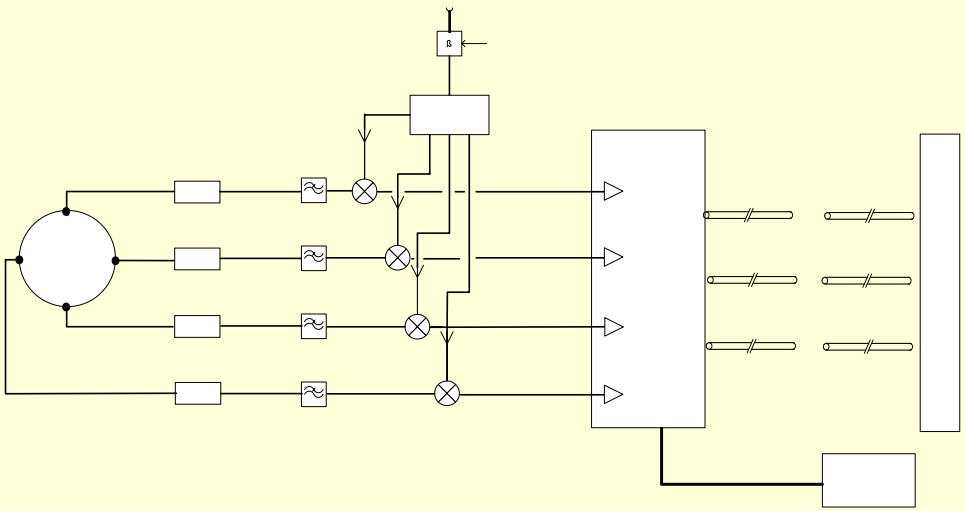
Vertical sensitivity



Sigma

Button PU



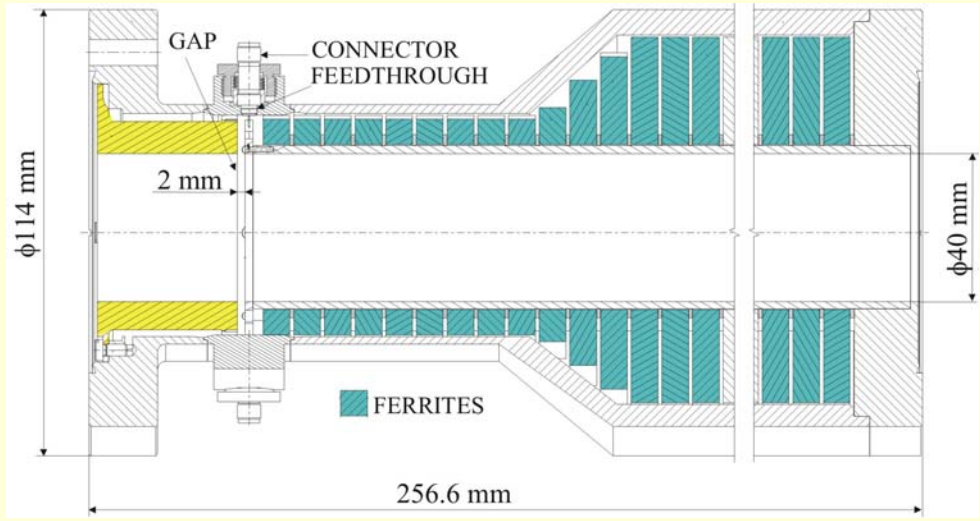


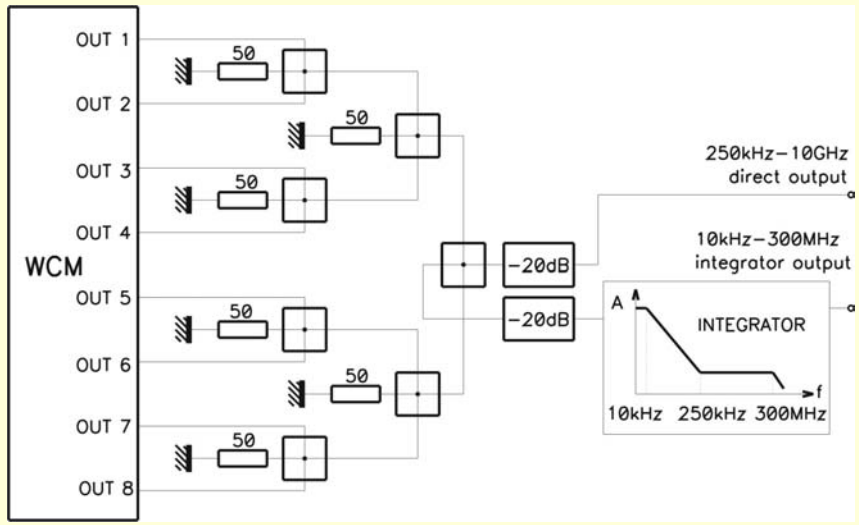
Transverse sensitivity	Δ= Σ @ ~10mm
Resolution	0.01mm
Relative precision (±10mm)	1-5%
Longitudinal coupling impedance	0.1 / 1 ohm
Resolution [I]	12mA / 1.2mA
Low frequency cut off	1kHz
High frequency cut off (Waveguide)	200MHz (10MHz)
Calibration	No
ID / Length	40mm / 196mm
Number of feedthroughs	5
Waveguide	WR28
Flange types	DN40CF
Max. bake-out temperature	130 °C

Wave guide

2 x Horn Antenna

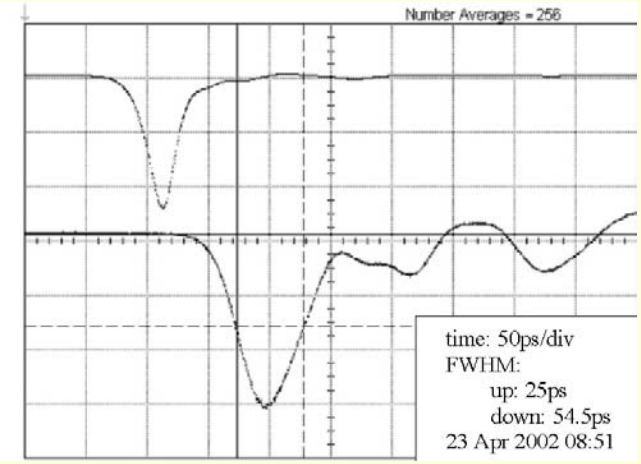
Wall current monitor
(J. Durand - P. Odier)

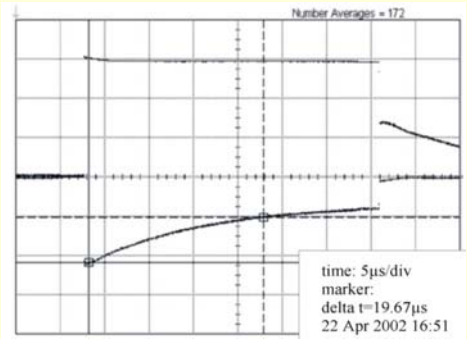




Wall current monitor

P. Odier





Impedance	0.5 ohms
Resolution	~4mA
Absolute precision	~ 1%
Low frequency cut off	10kHz
High frequency cut off	10GHz
Calibration	No
Number of feed-troughs	8
Gap length	2mm
ID / Length	40mm / 256.6mm
Flange types	DN63CF
Max. bake-out temperature	165 °C

Intensity and Position monitors

- From first beams the PU's gave good analog signals, enabling the operation crew to steer the beam.
- For the intensity measurements there were some confusion between scaling factors and gun settings in the beginning, but there seems to be a good coherence between monitors now. At high currents the BPE's seems to be charged by secondary electrons?
- Future : Include calibration (BPE, BPM) data in position and intensity measurements. Polarize BPE electrodes.