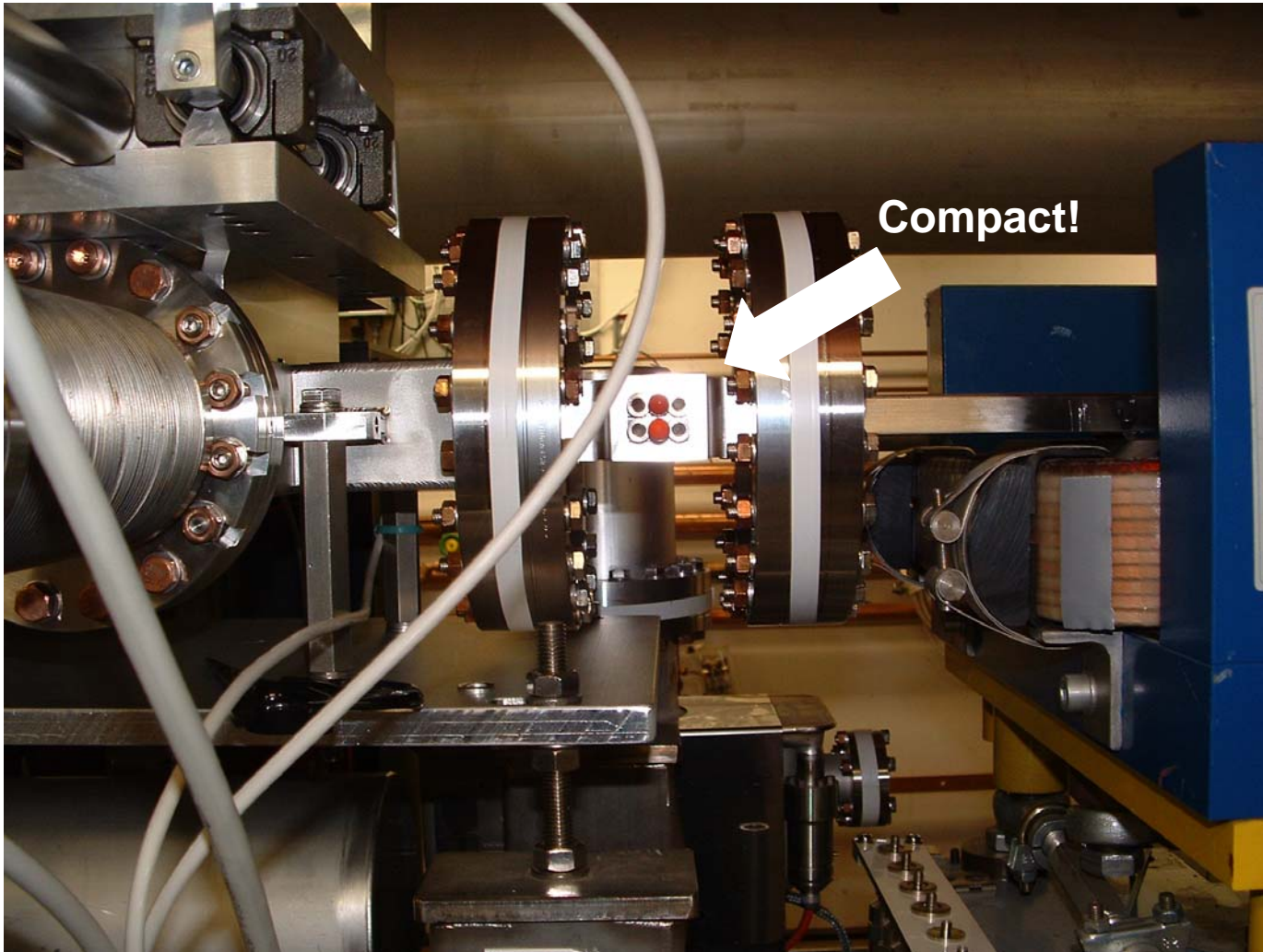


Installation of a high-precision BPM in BC3

Kirsten Hacker

20-03-07

BPM installed in BC2



Thanks to:

Jan Hauschildt
Dirk Noelle
Silke Vilcins
Holger Schlarb
Nils Mildner
Christopher Gerth
And many more...

Magnet power supplies:
Long term stability $1e-4$
Short term stability $1e-5$

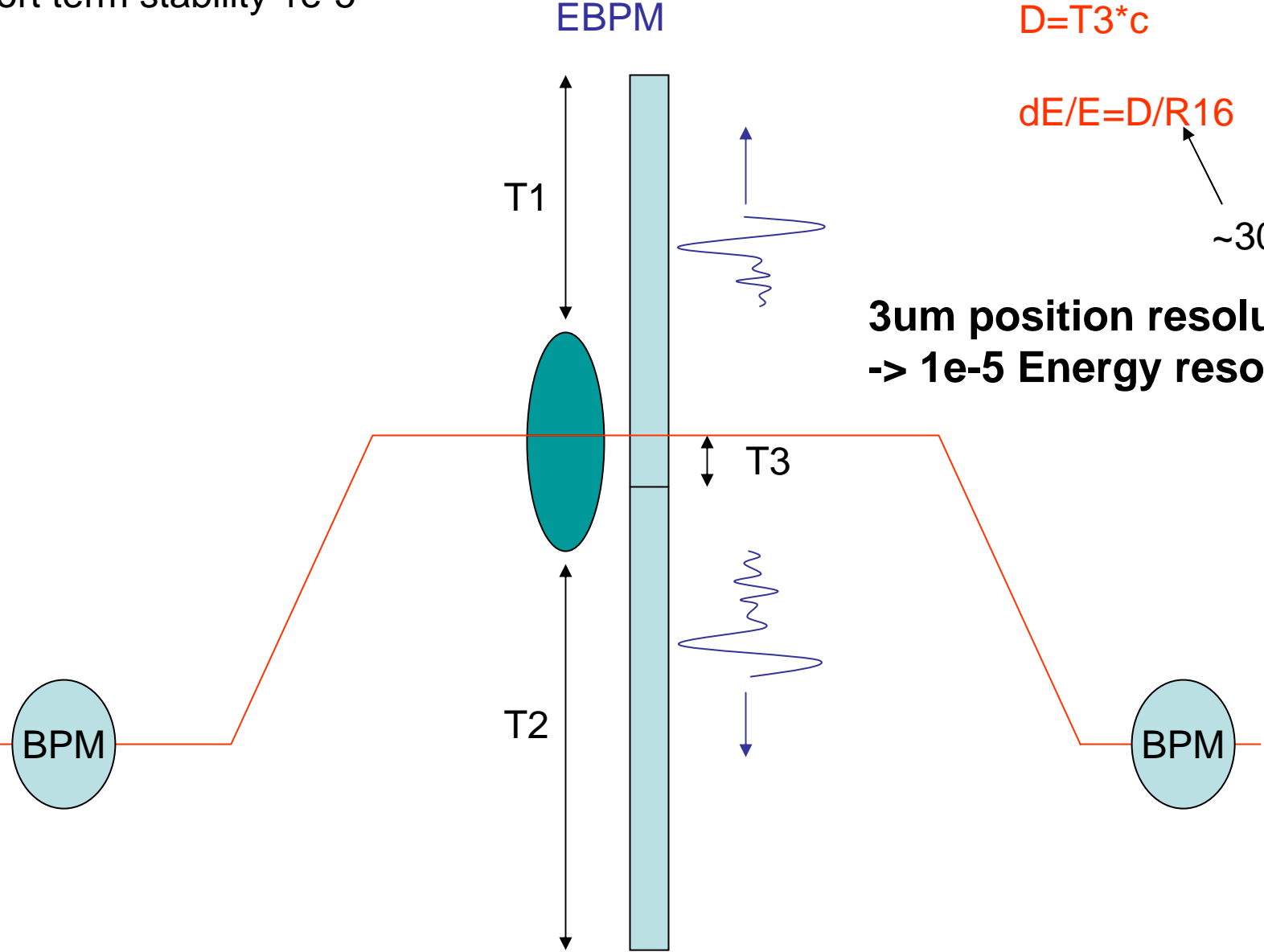
$$T1-T2=T3$$

$$D=T3*c$$

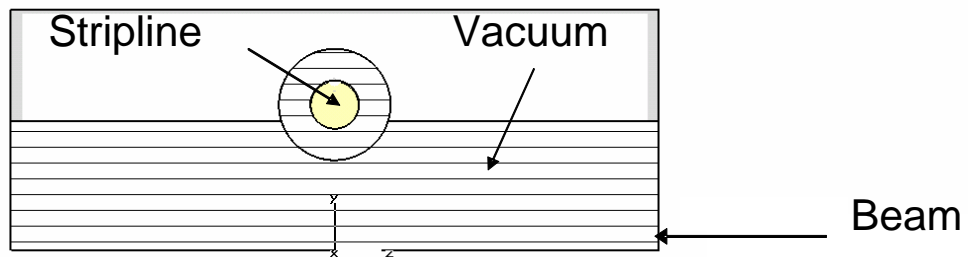
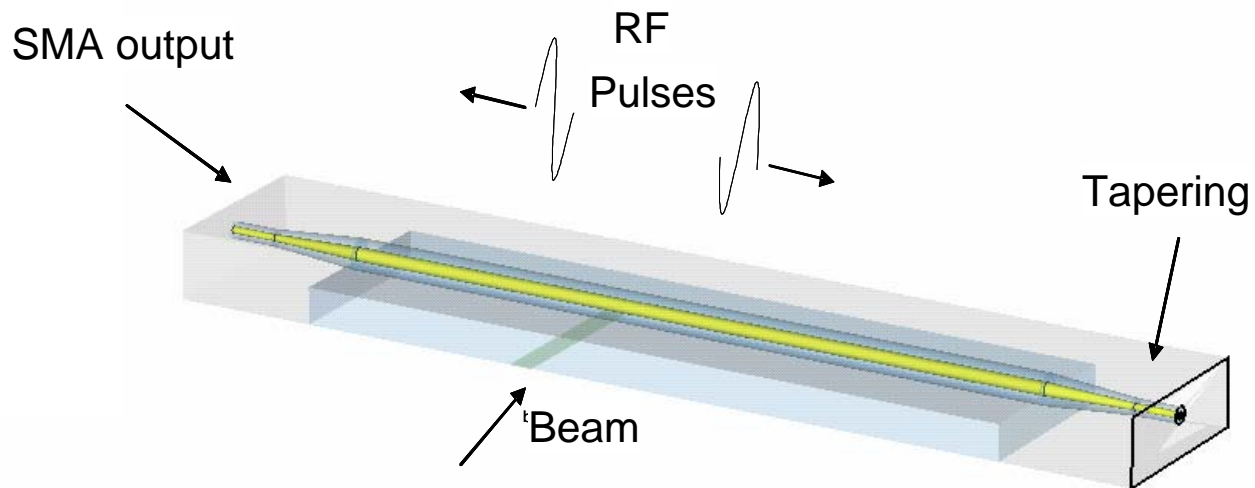
$$dE/E=D/R16$$

$\sim 300\text{mm}$

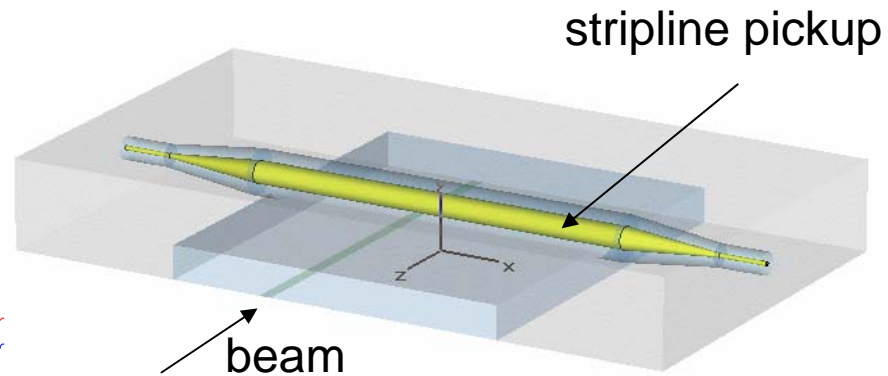
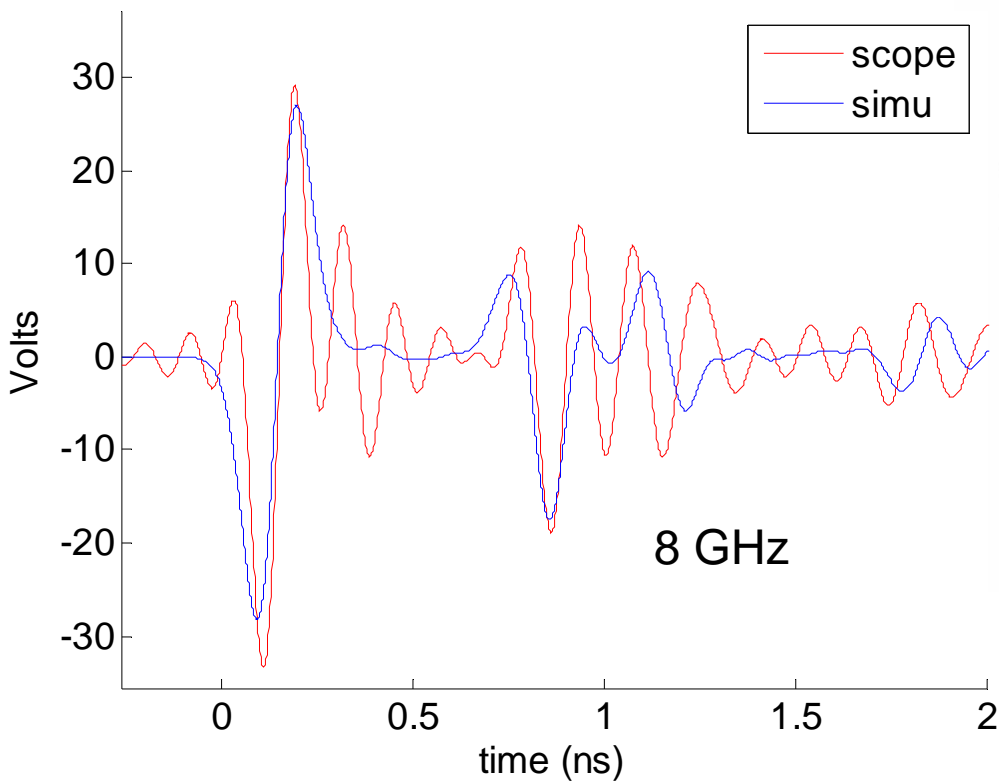
**3um position resolution
-> $1e-5$ Energy resolution!!!**



BPM for the Bunch Compressors



simulation and oscilloscope readout



laser pulses
from fiber link

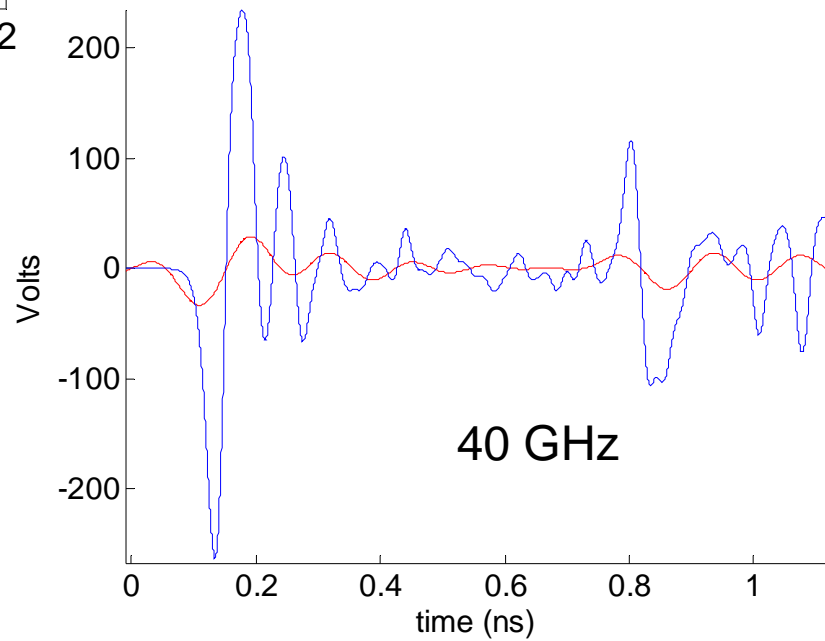
beam
pick-up

EOM

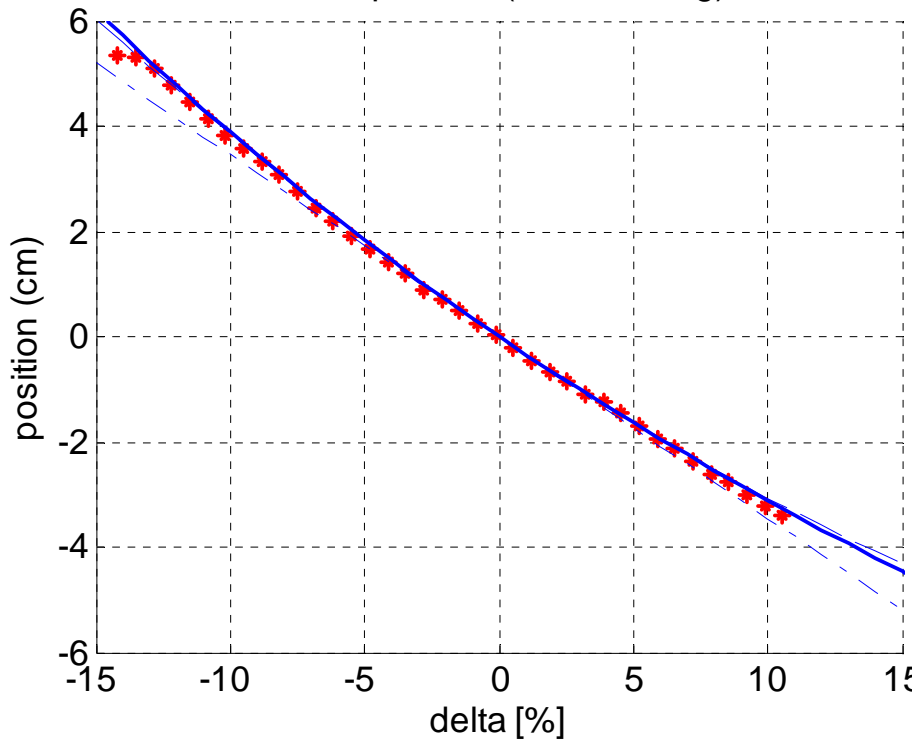
ADC

resolution < 3 μ m

simulation and oscilloscope readout



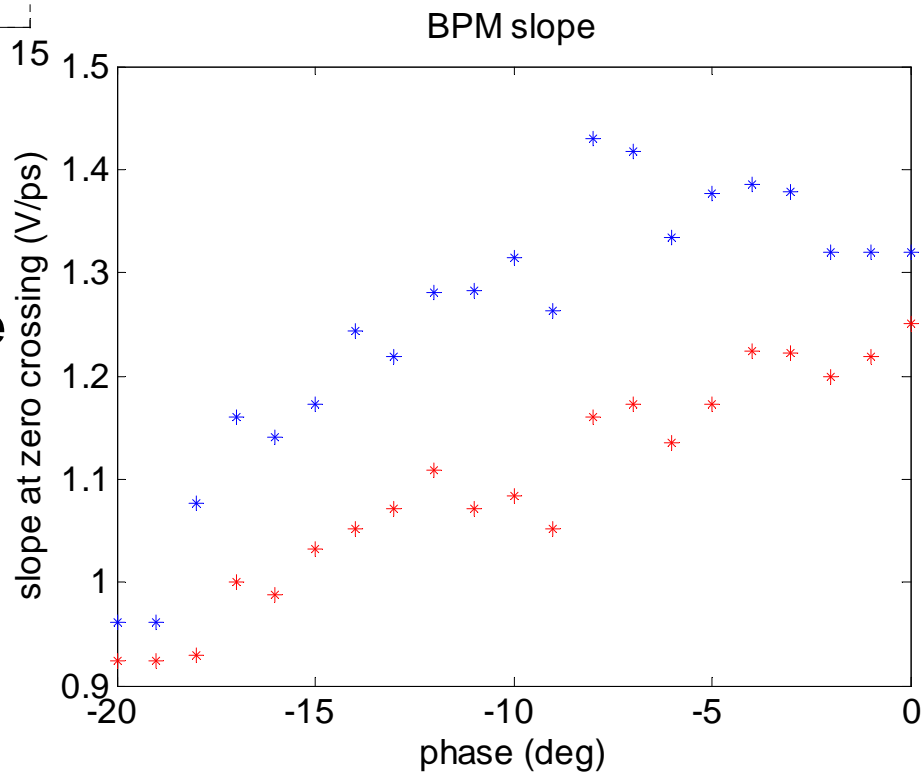
Beam position ($\alpha = 18.0$ deg)



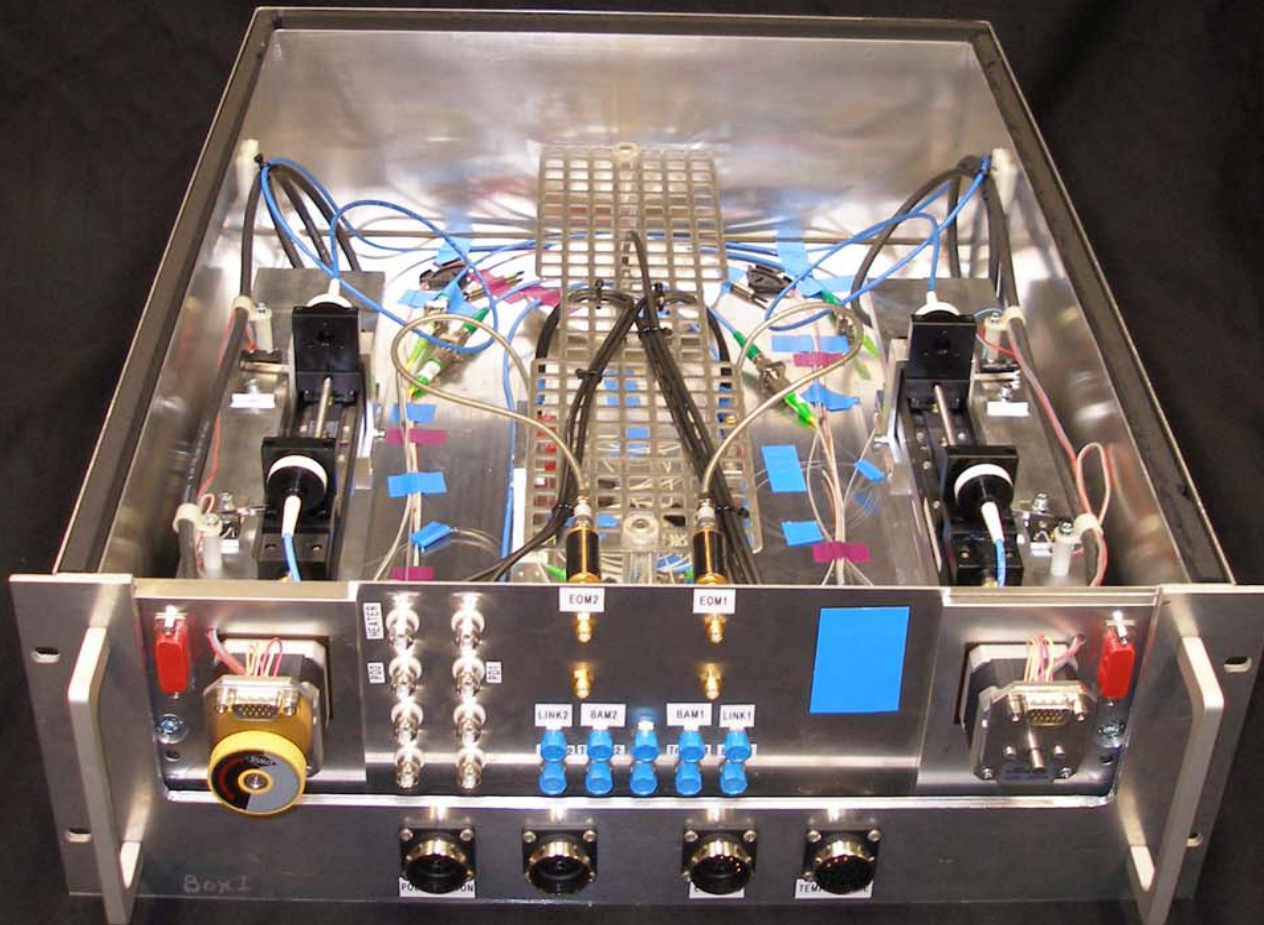
R16
T166
R3666

← 10 cm measurement range

Weak dependence of signal slope on beam width →

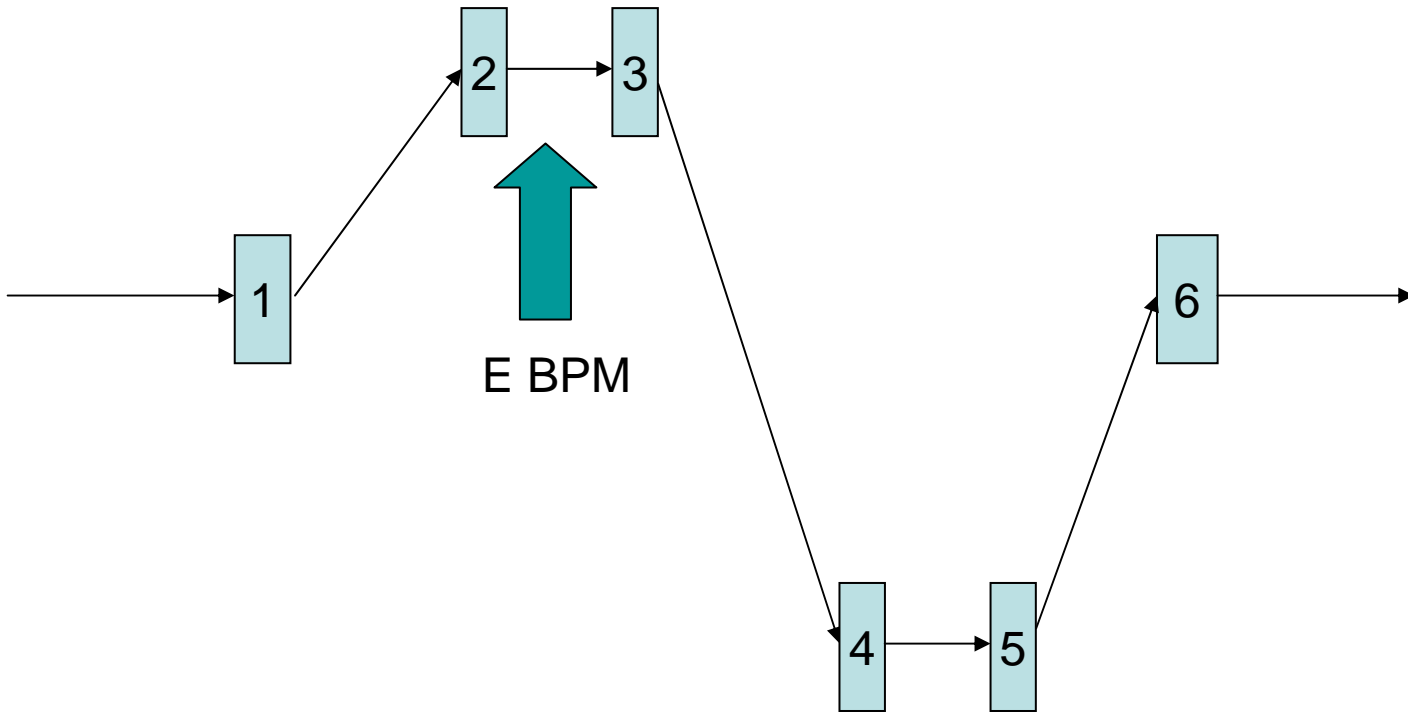


Installation of electro-optical frontends

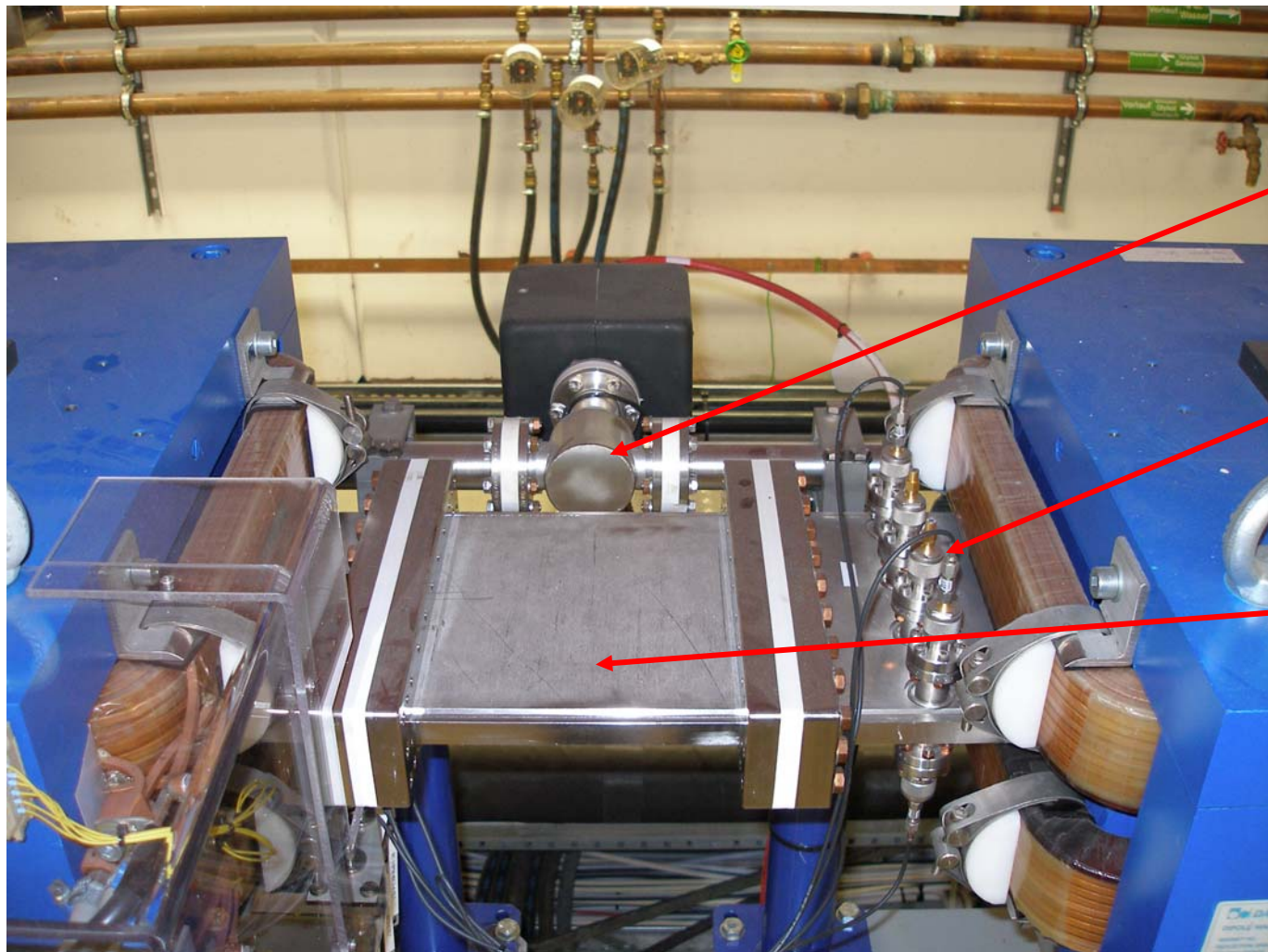


BC3

TTF2 (3.8°)
 $R_{56} = 48.6\text{mm}$
 $R_{16} = 192\text{mm}$
 $E = 380\text{-}450\text{ MeV}$



BC3 currently

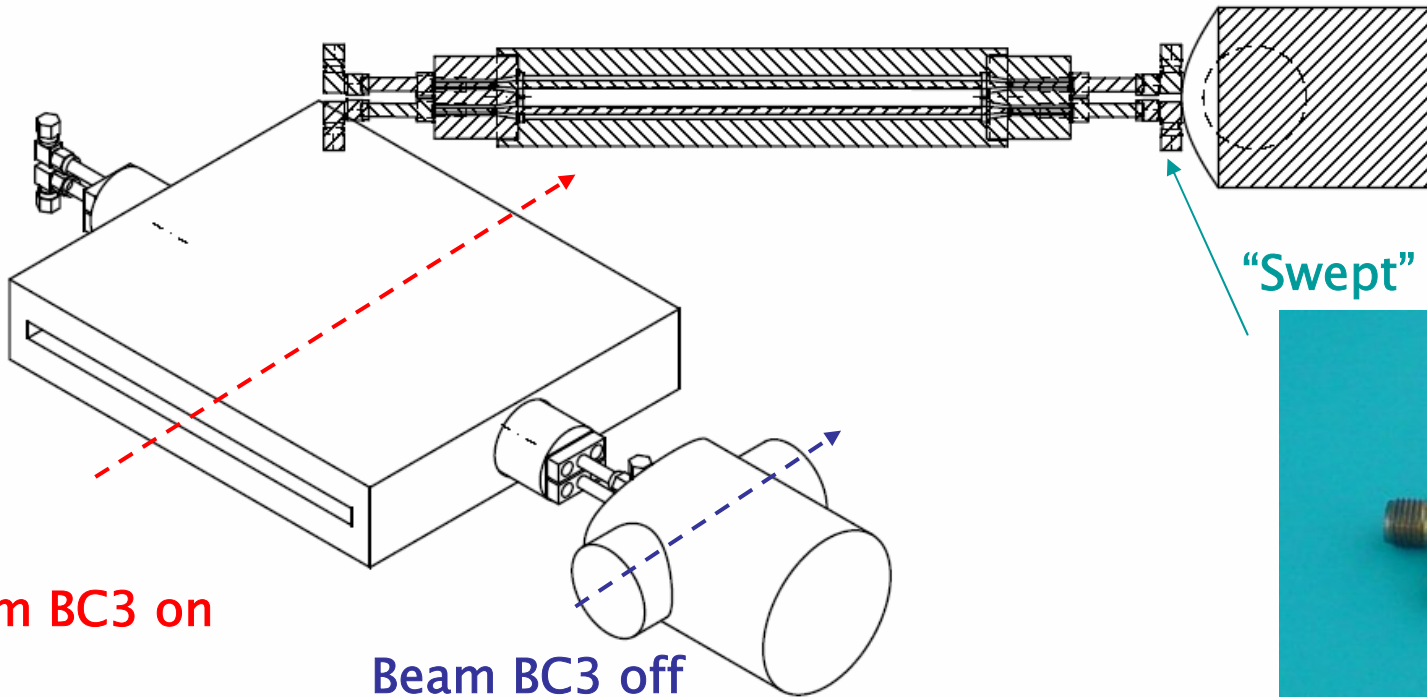
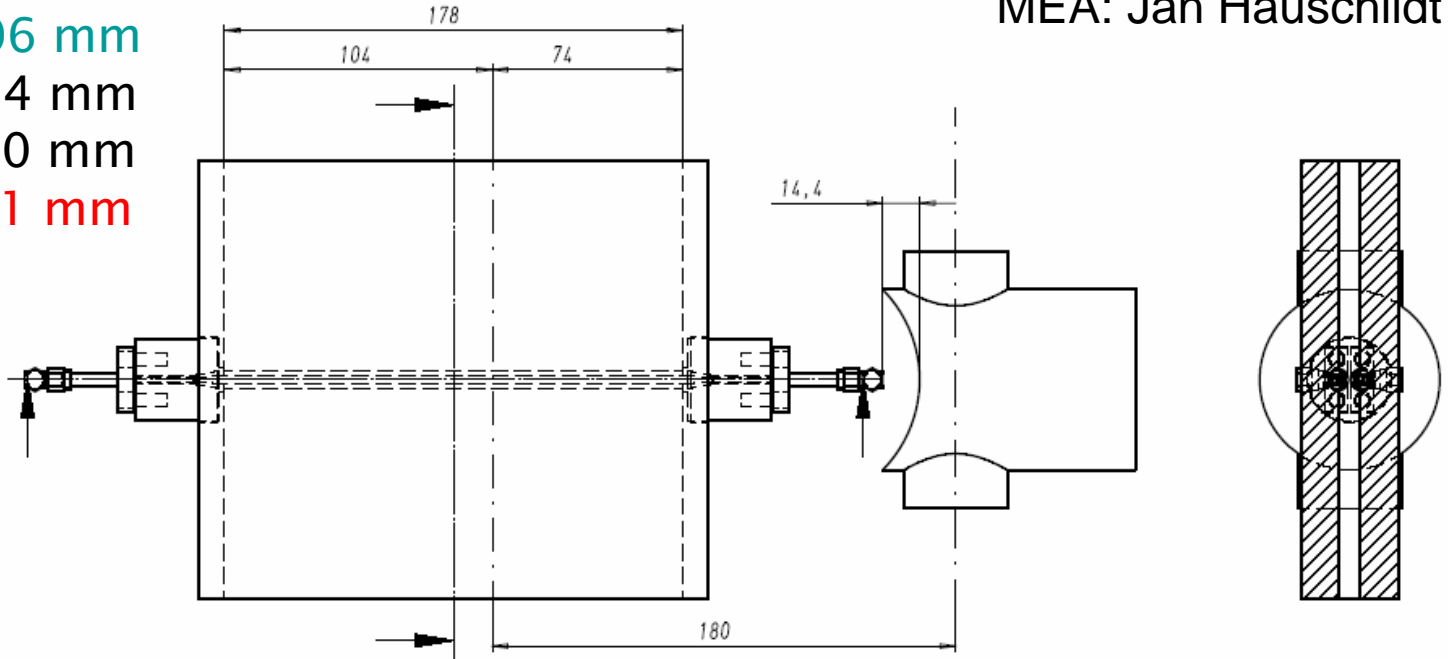


Vacuum Chamber
For pumping

Old Button
BPM

Spare
chamber

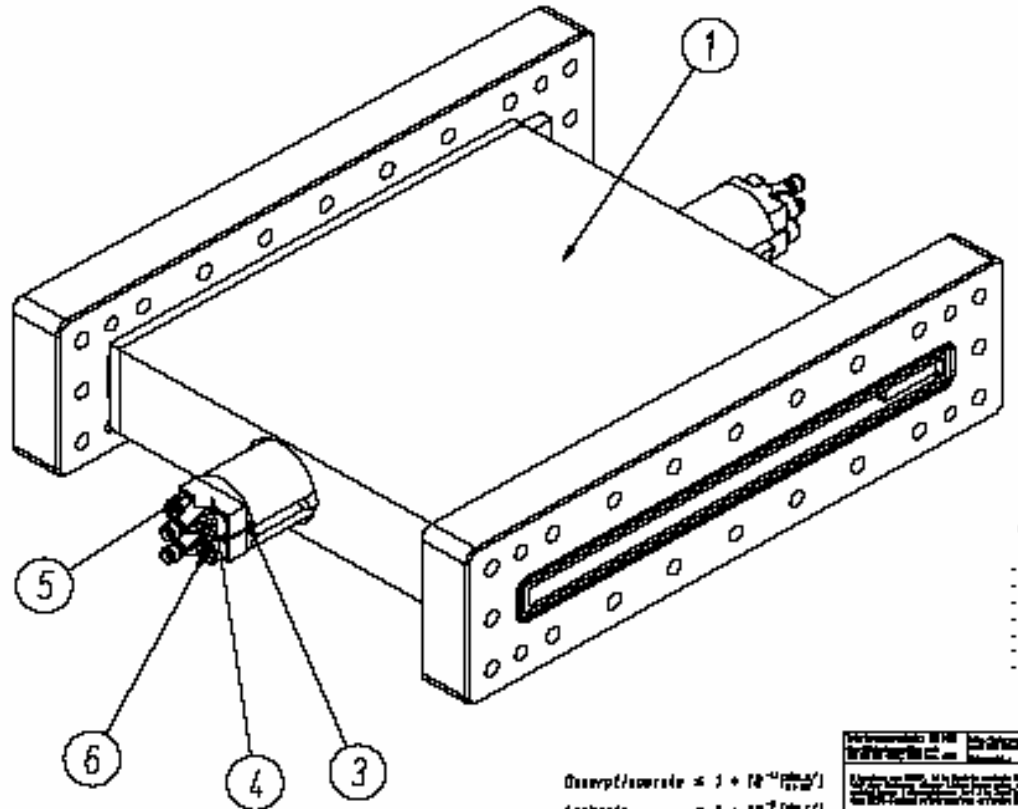
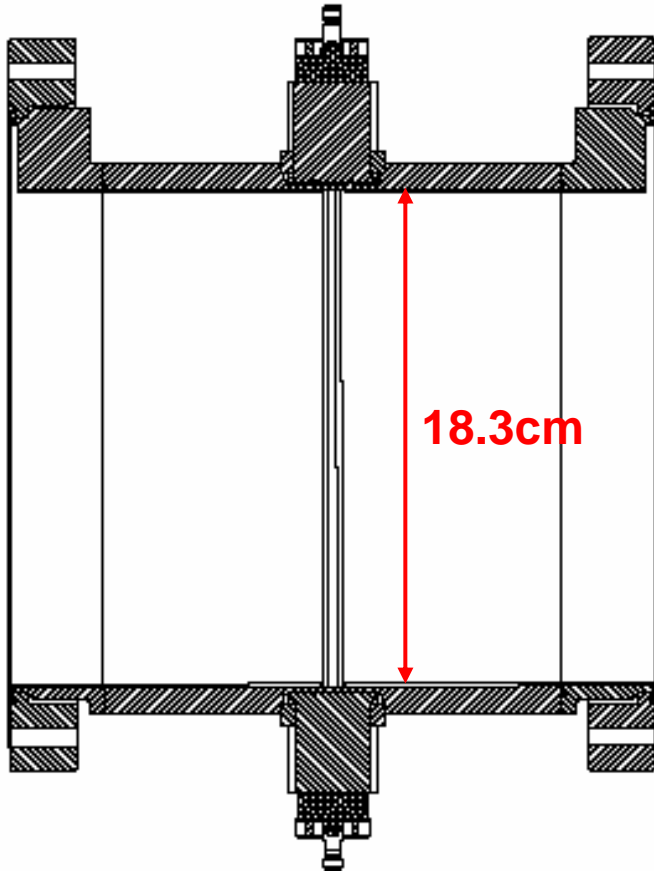
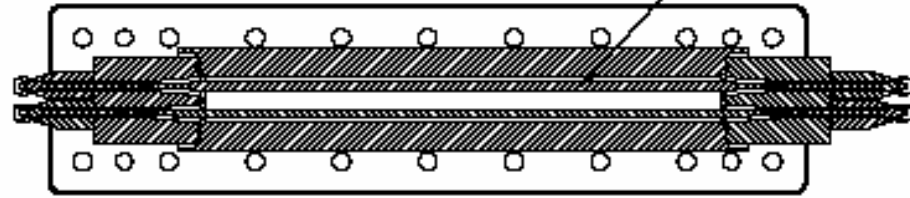
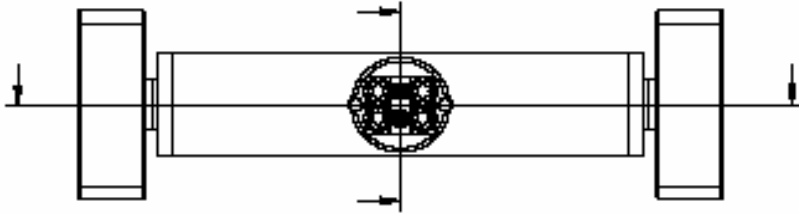
X-min old = 81 mm
X-min new = 106 mm
X-max o&n = 284 mm
X-center = 180 mm
X-nominal = 191 mm



"Swept" Elbow (18 GHz)



MEA Jan Hauschildt
 MVP Nils Mildner
 MDI (feedthrough assembly)



Verfahren

- plite Art
- Anfass
- Fassdr
- Elektr
- Dicht
- Dicht
- Volt

Geometrische Genauigkeit $\leq 3 \cdot 10^{-4} [\mu\text{m}/\text{m}^2]$
 Leckrate $\leq 3 \cdot 10^{-9} [\text{m}^3/\text{m}^2]$

Verfahren		Material	
Material	Verfahren	Material	Verfahren