Magnet Measurement Device for MICE

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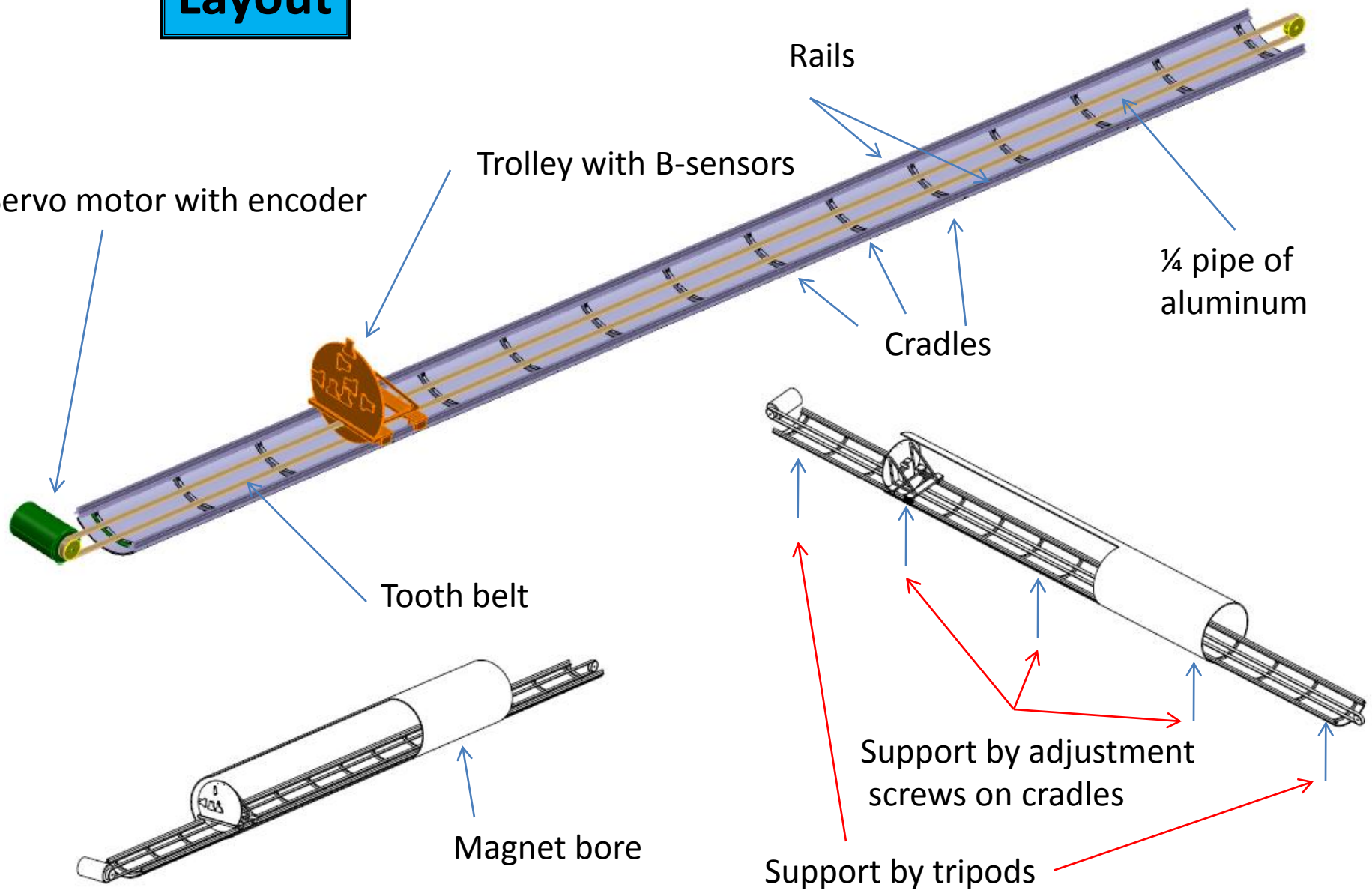
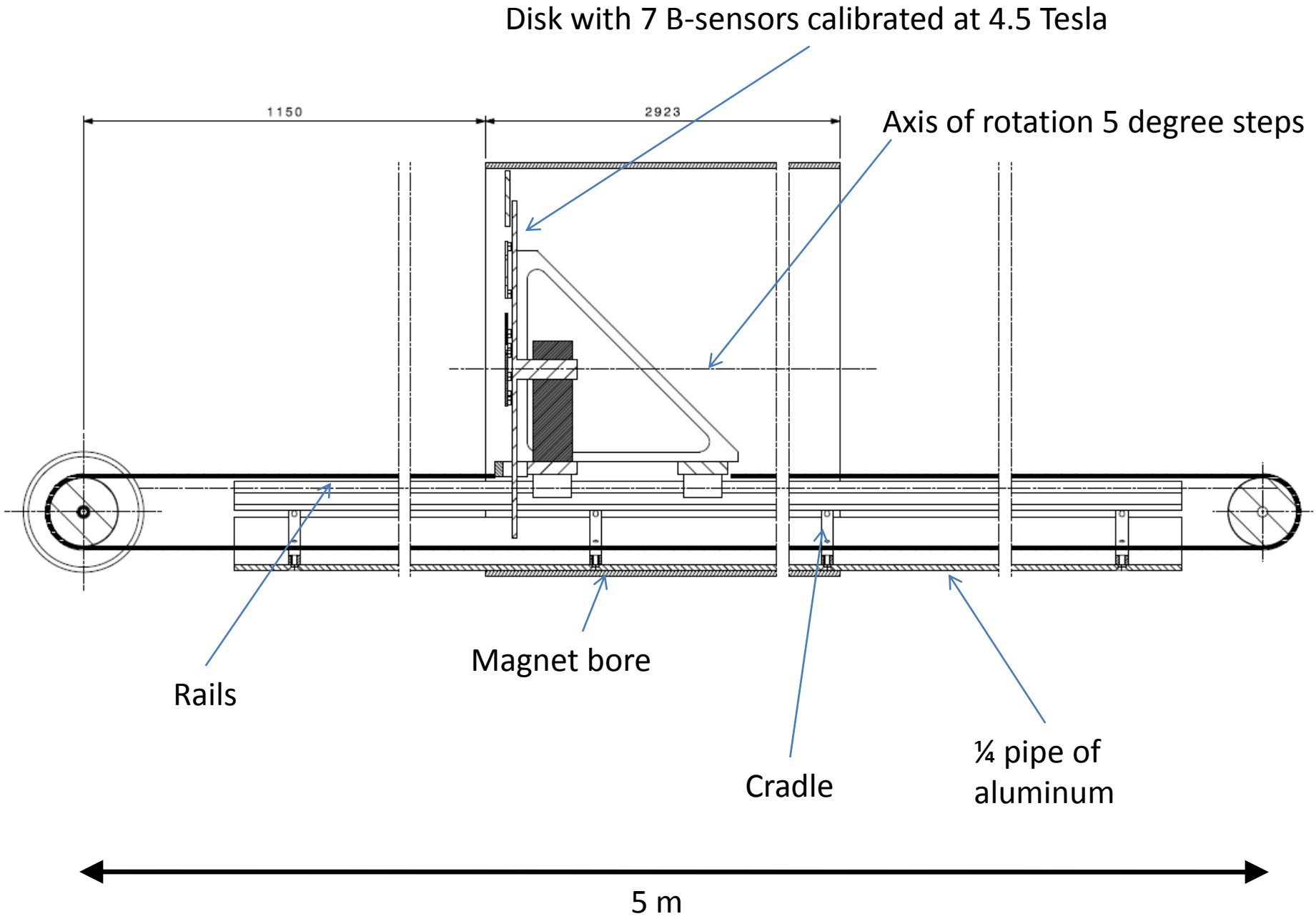
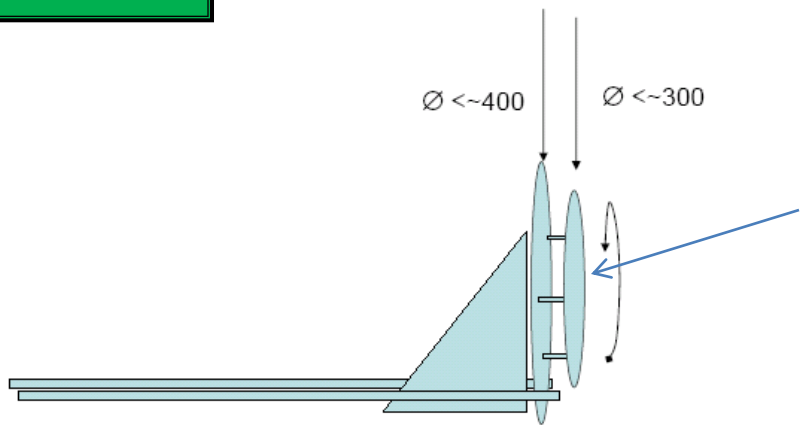
technical drawings by O.Jamet

Layout

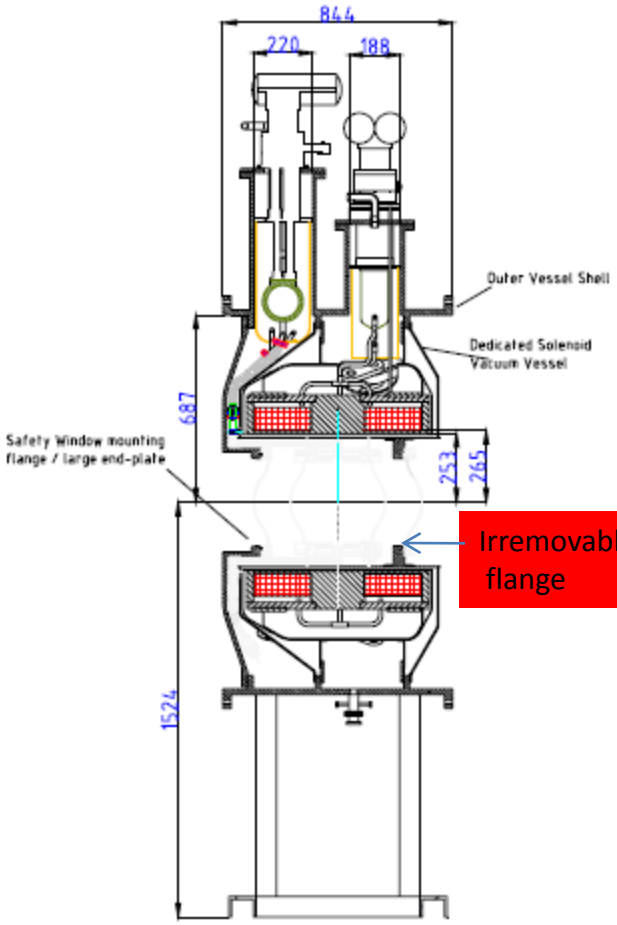

Rails
Trolley with B-sensors
Servo motor with encoder
¼ pipe of aluminum
Cradles
Tooth belt
Magnet bore
Support by adjustment screws on cradles
Support by tripods


Disk with 7 B-sensors calibrated at 4.5 Tesla
1150
2923
Axis of rotation 5 degree steps
Rails
Magnet bore
Cradle
¼ pipe of aluminum
5 m

2 versions



Extension disk for AFC

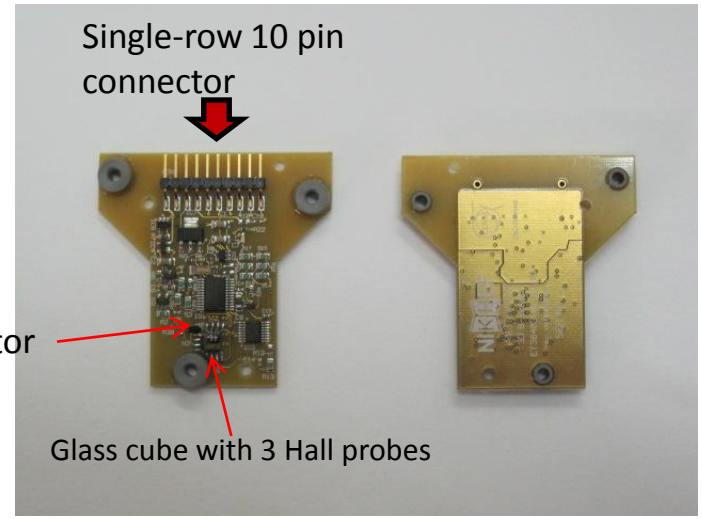


5m version for spectrometer solenoids

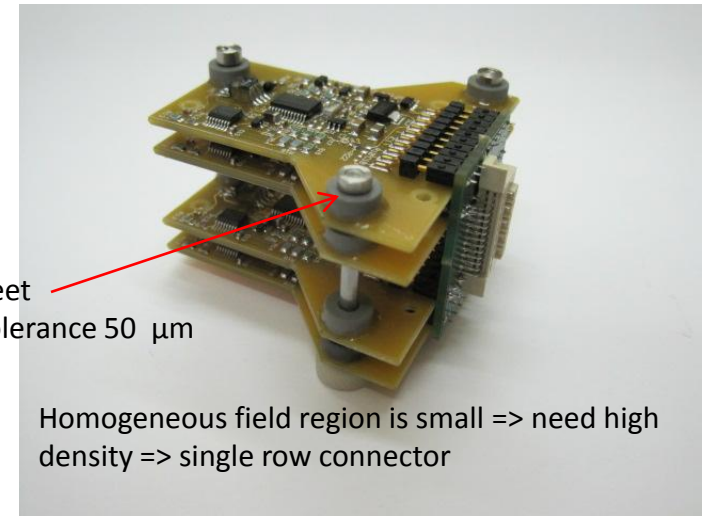
2m version for focus absorber solenoids.

Extension disk to by-pass internal flange AFC
Need to measure from both sides

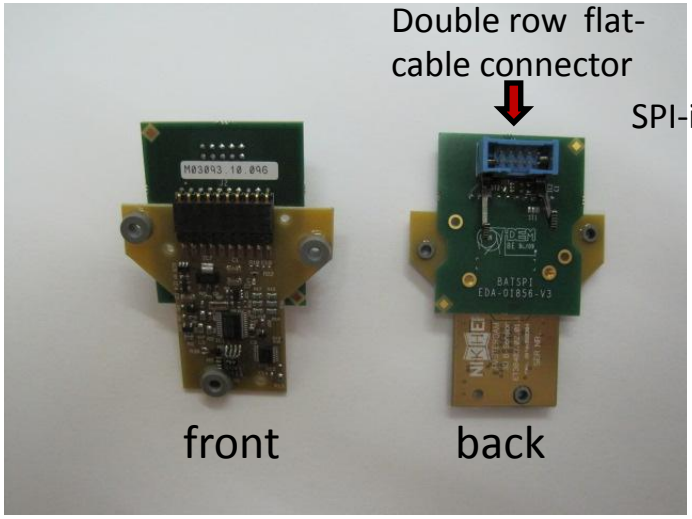
2m version could be used to measure eventually coupling coils



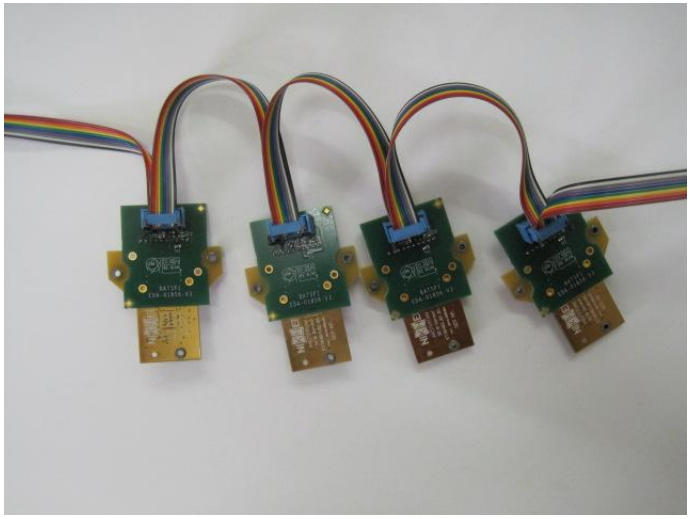
B-sensor card



Stack of B-sensors in calibrator

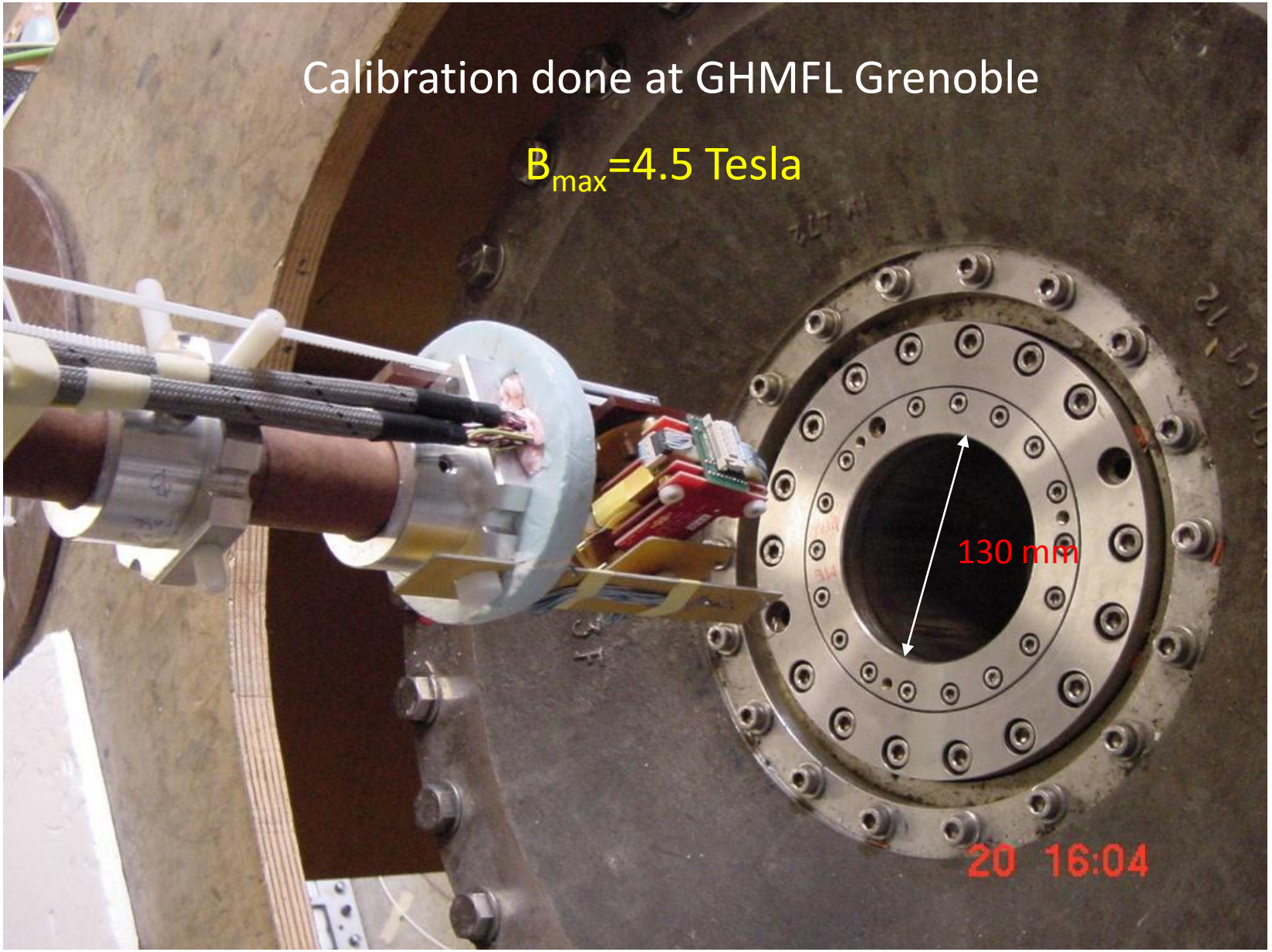


SPI-interface

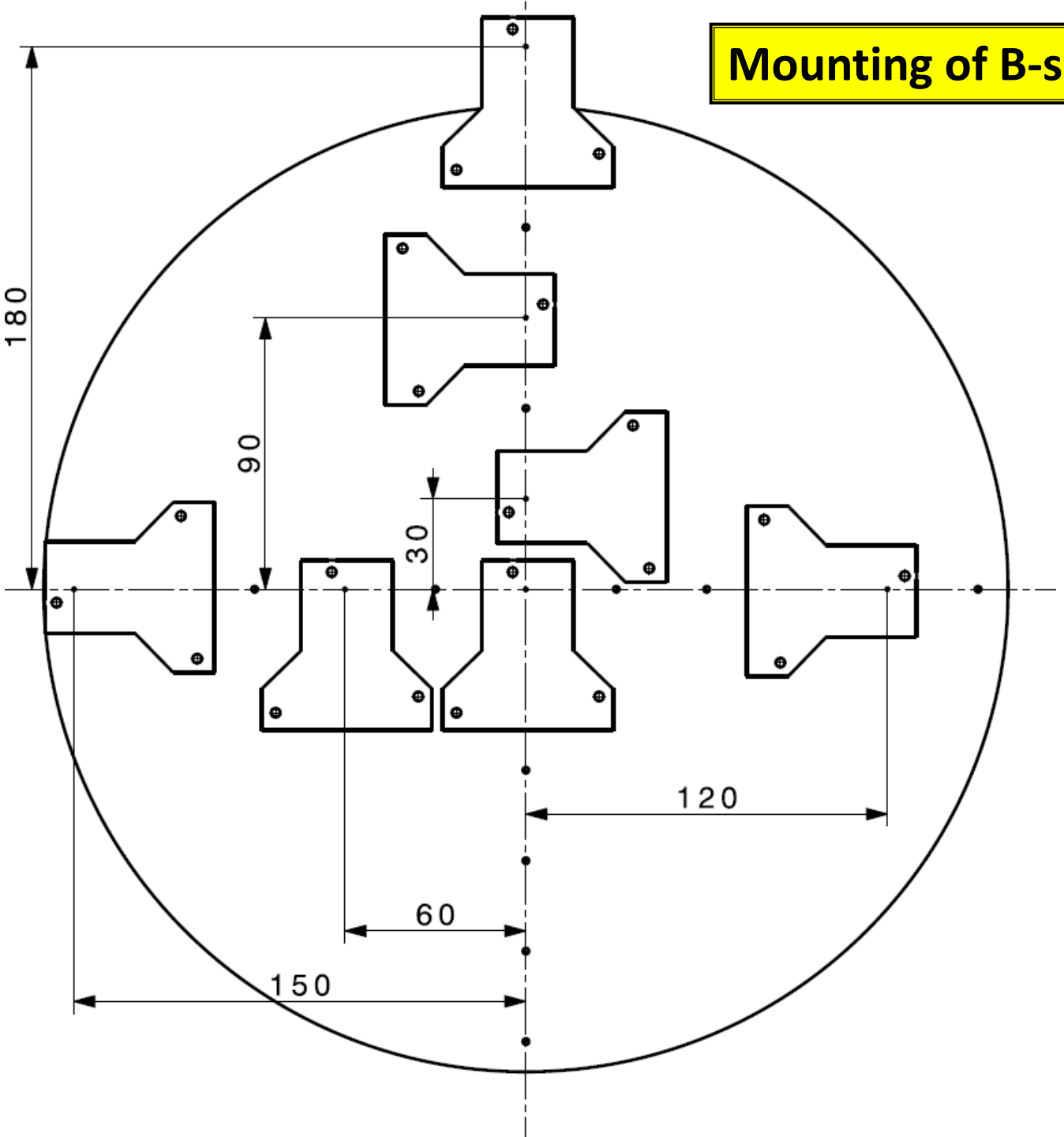


Passive backplane for B-sensor to carry double-row connector

Daisy chain B-sensors

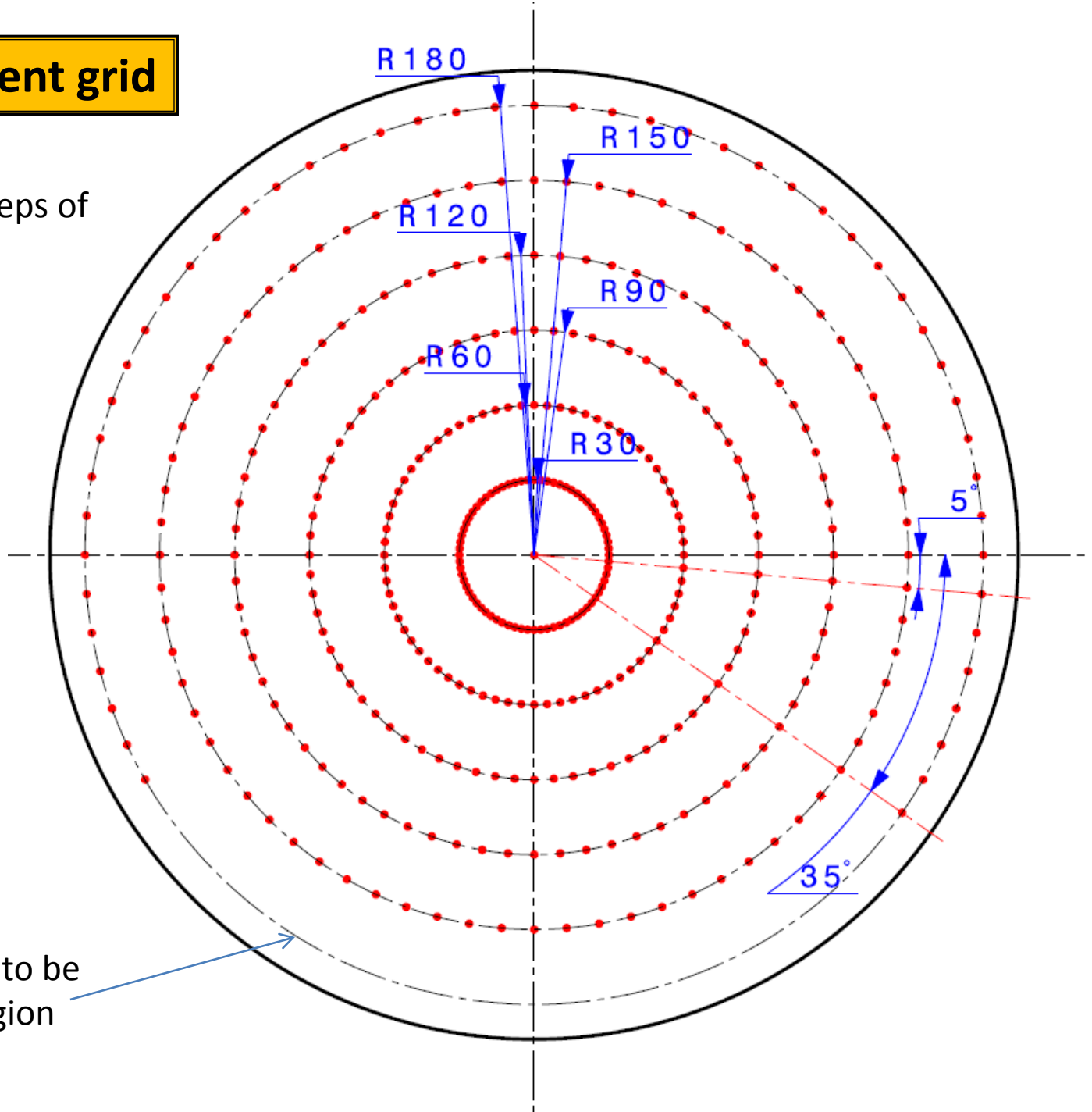

Calibration done at GHMFL Grenoble
B_{max}=4.5 Tesla
130 mm
20 16:04

Mounting of B-sensors

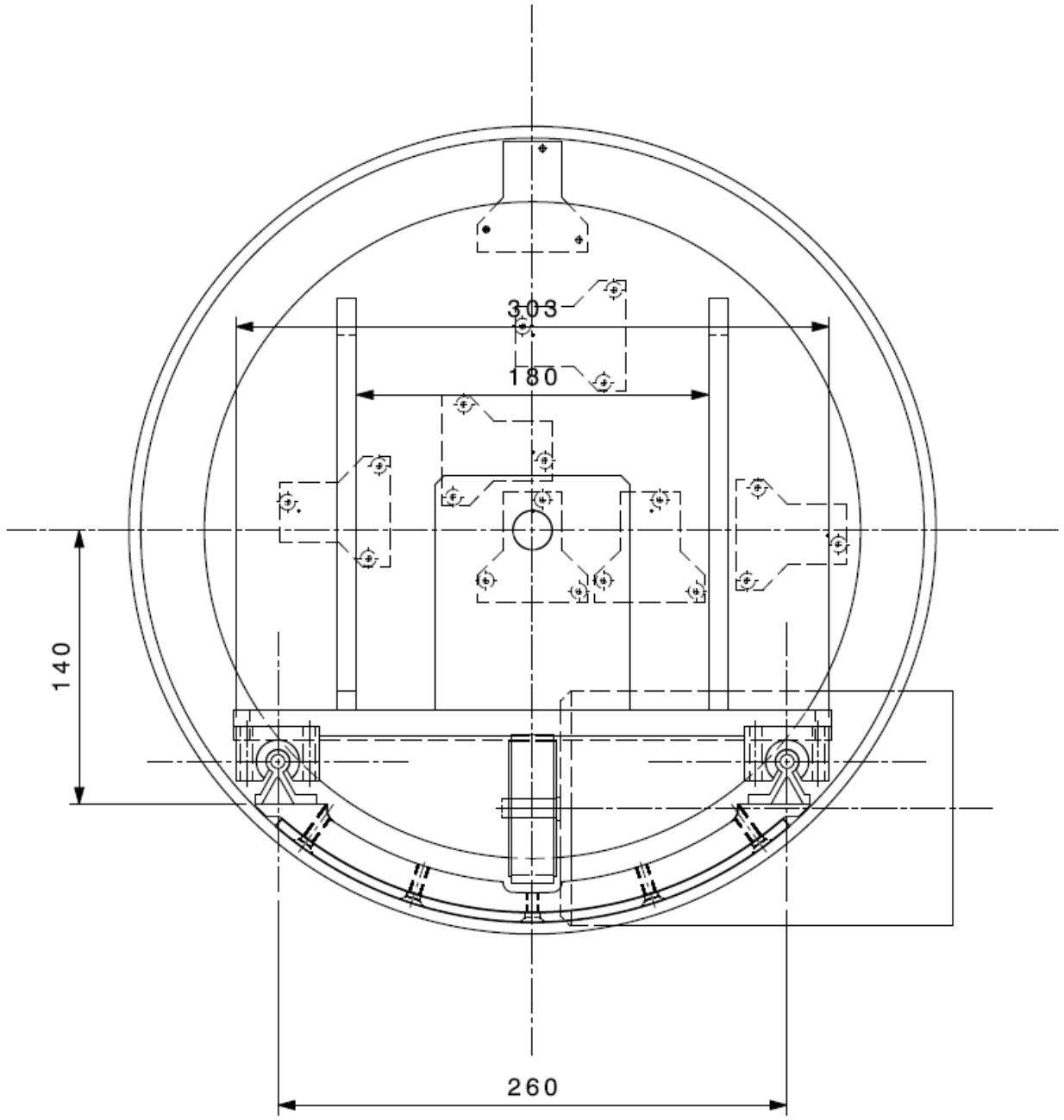


Measurement grid

Disk can rotate in steps of 5 degree



180 mm sensor has to be removed for this region


303
180
140
260

DAQ + control

SPI -> RS232 interface, SPI-bus with 7 slots

Where to put interface: inside or outside 4 Tesla?

Leave both options open

DAQ program (MSVC) runs on PC (laptop)

BALDOR servo engine with NextMove ESB motion controller
ESB connected with CANbus to PC

STRATEGY

mechanics:

1 build 5 m version , test precision
2 if precision insufficient add encoder, foresee laser tracker during measurements
3 build 2 m version

DAQ:

Build simple read-out for 7 B-sensors
Anticipate to have interface outside high field region

Accuracy:

Better than 0.5 mm longitudinal
+/- 0.1mm radial
+/- 1 mrad directive
Bx,By,Bz +/- 2 mT Check in situ with NMR
Surveying done at CERN with laser tracker