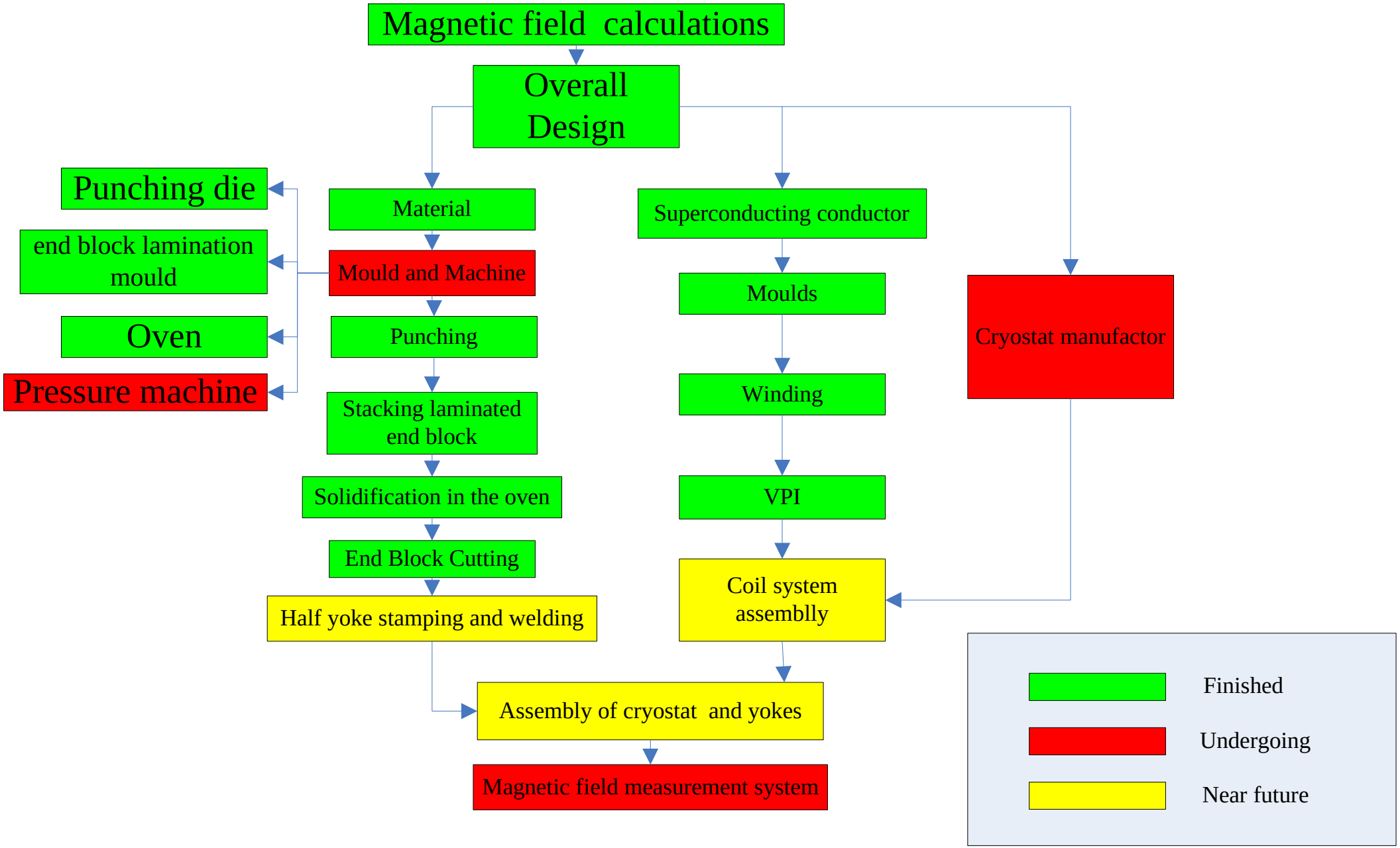
Progress

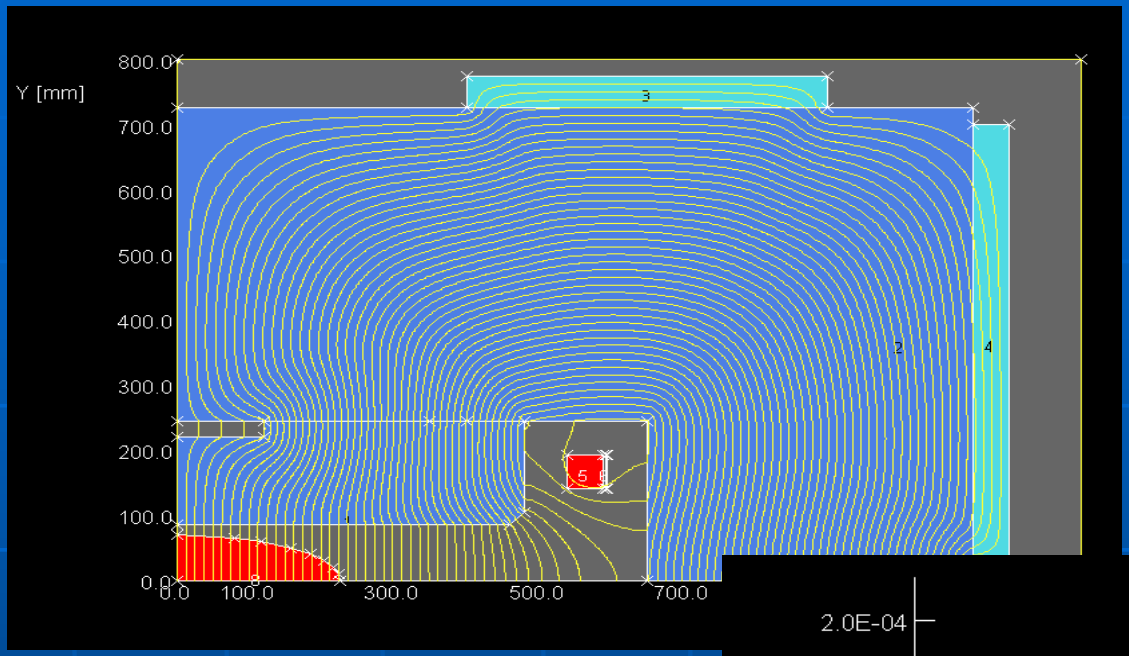
of Super-FRS dipole

IMP, Lanzhou

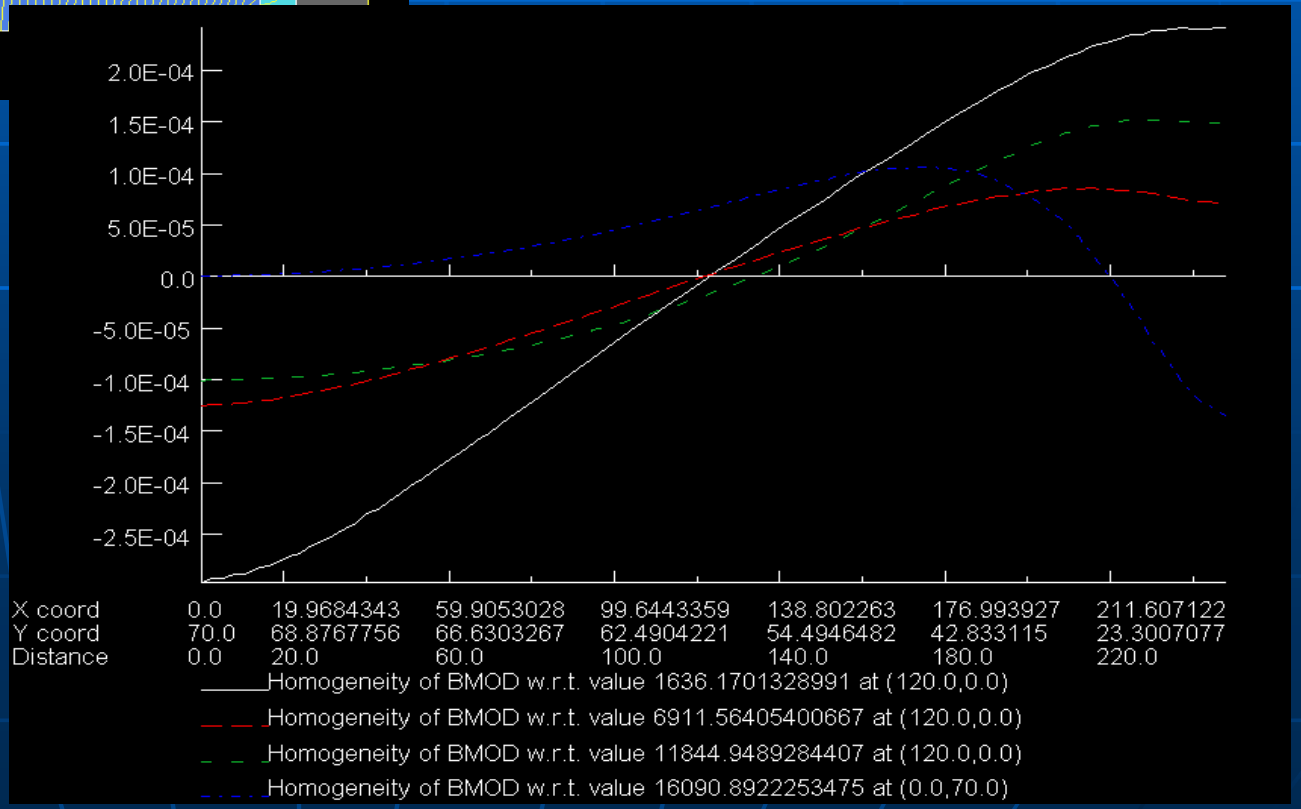
Flow Chart of The Super-ferric Magnet Manufacture



Results of the calculations

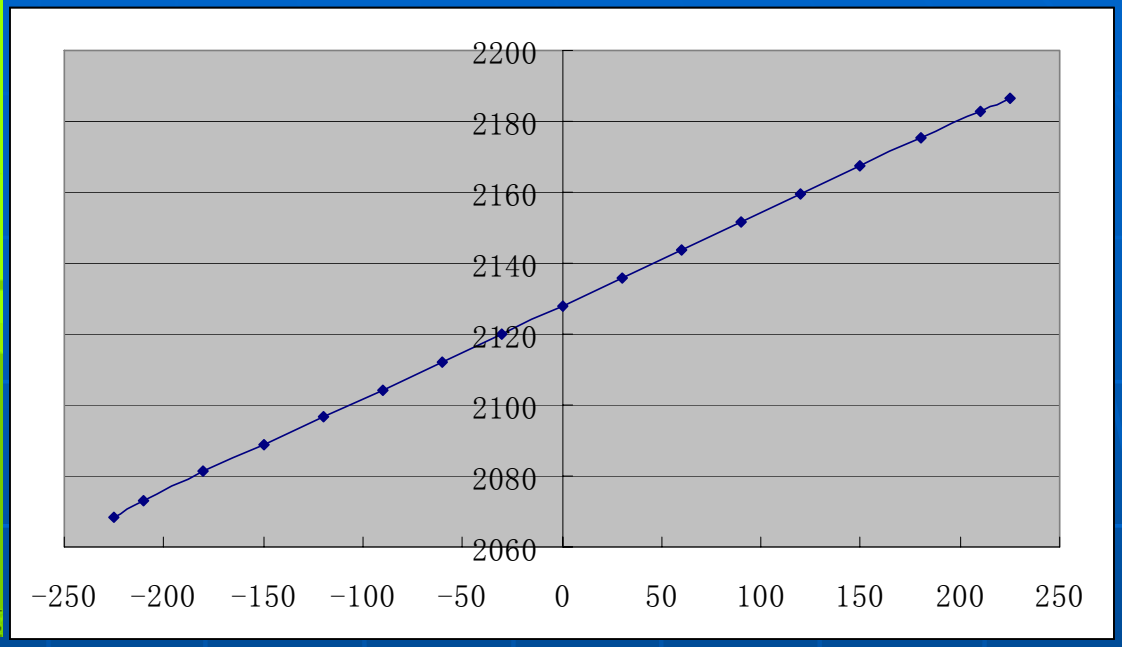


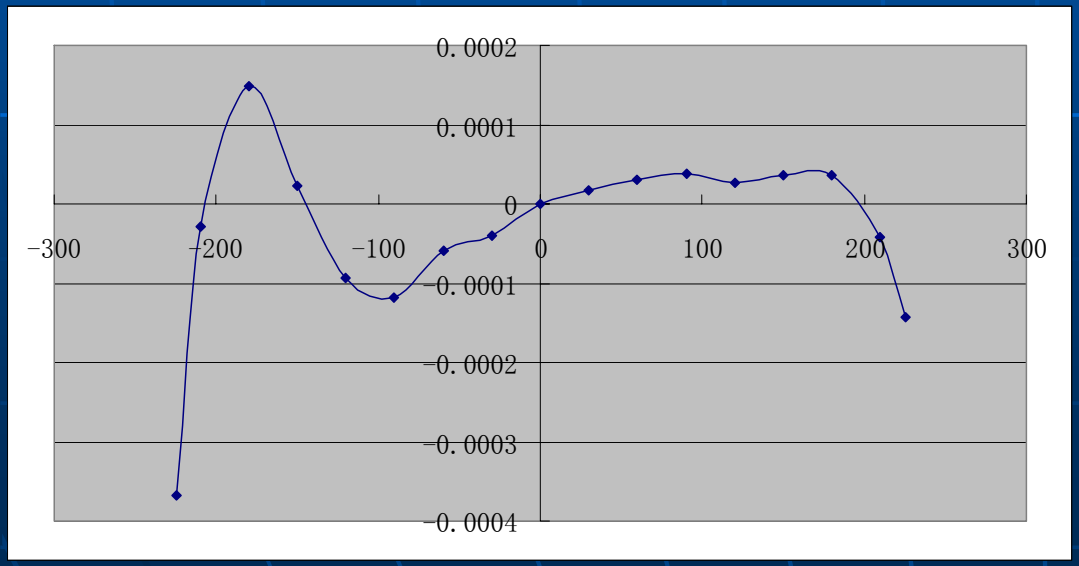
Left: the 2D quarter profile of Super-FRS dipole



Right : the 2D field distribution with different field levels

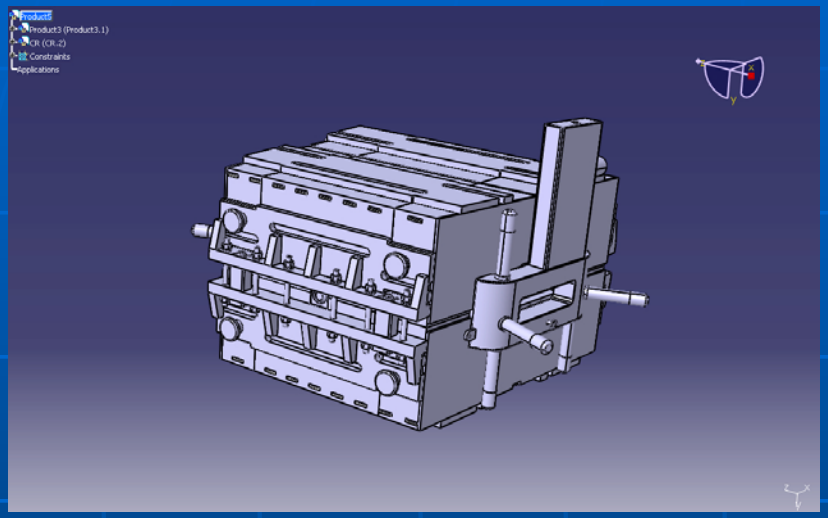
The integral field

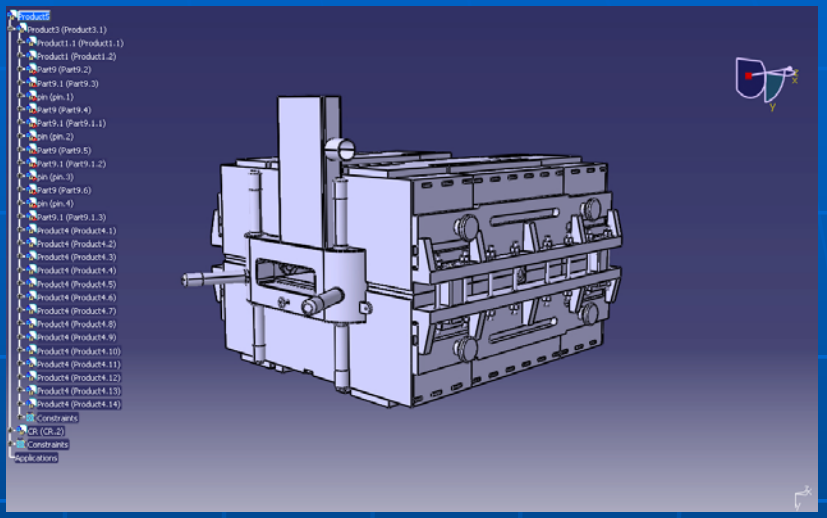


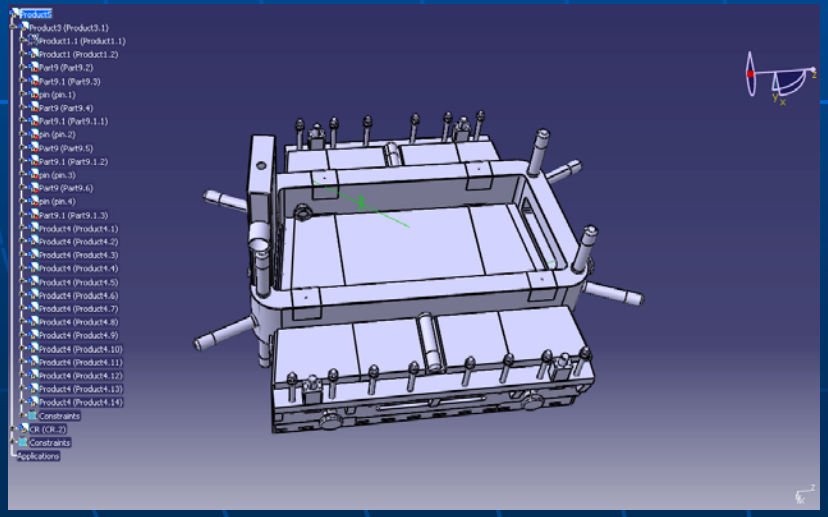


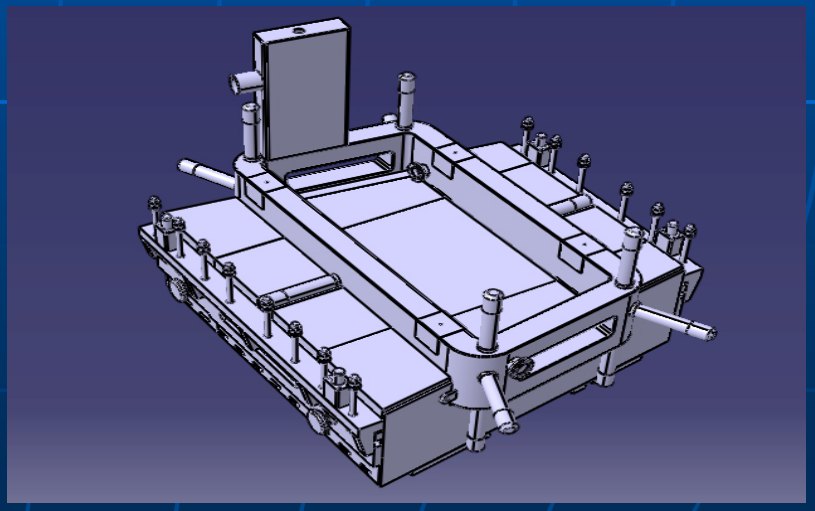
Upper left: the pole-end chamfer, more complicate shape to reduce the influence of the air slot;
Upper: the integral field distribution;
Left: the integral field normalized distribution in the middle plane, that's need to optimize detailed.

Super-FRS Dipole







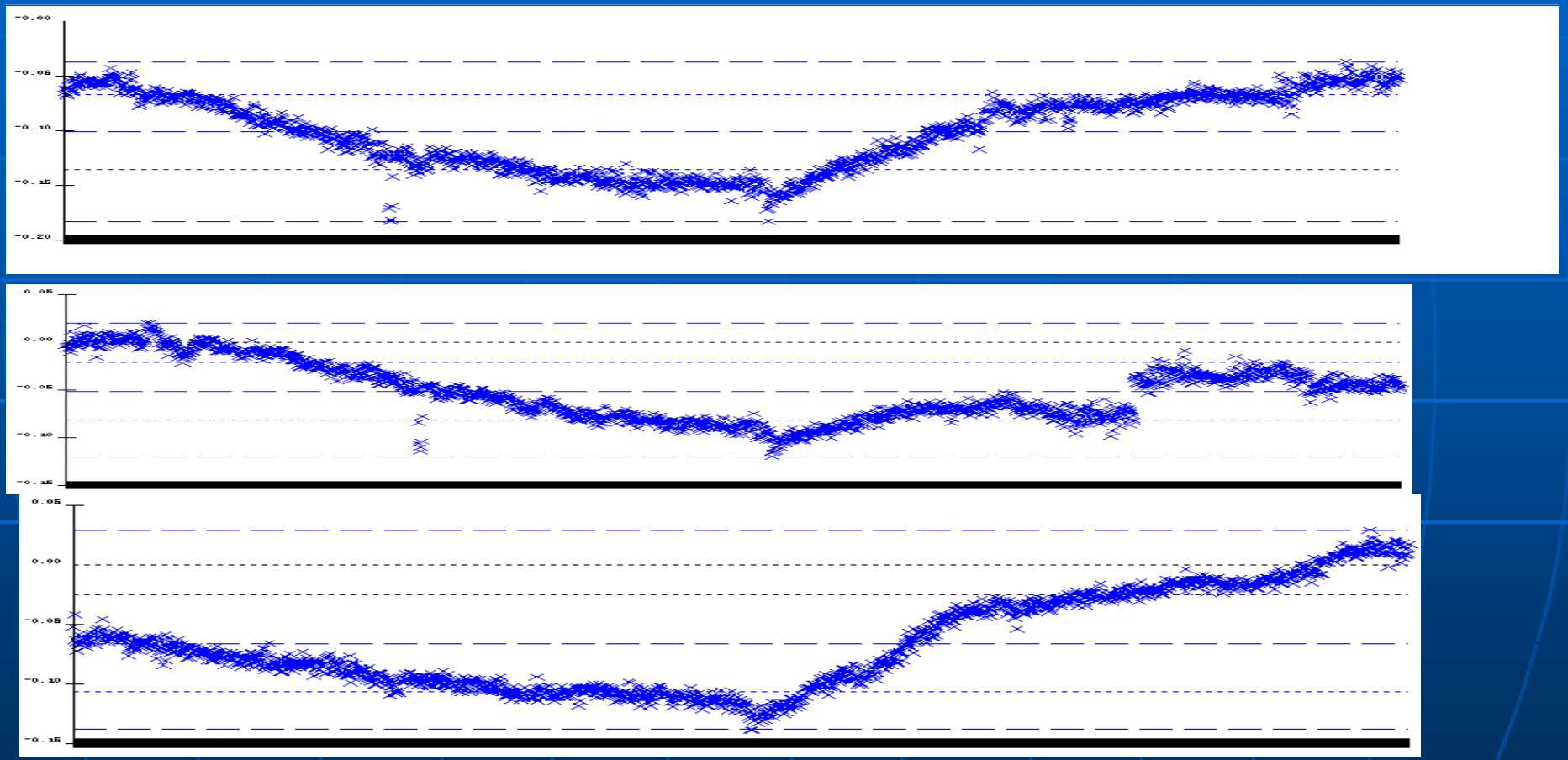


Yoke fabrication

- **The yokes have been finished.**
- **All the tests have been done.**
- **Assemble and adjust have been done.**
- **All mechanic examination have done.**
- **Low field measurement is doing.**

Sheets and testing

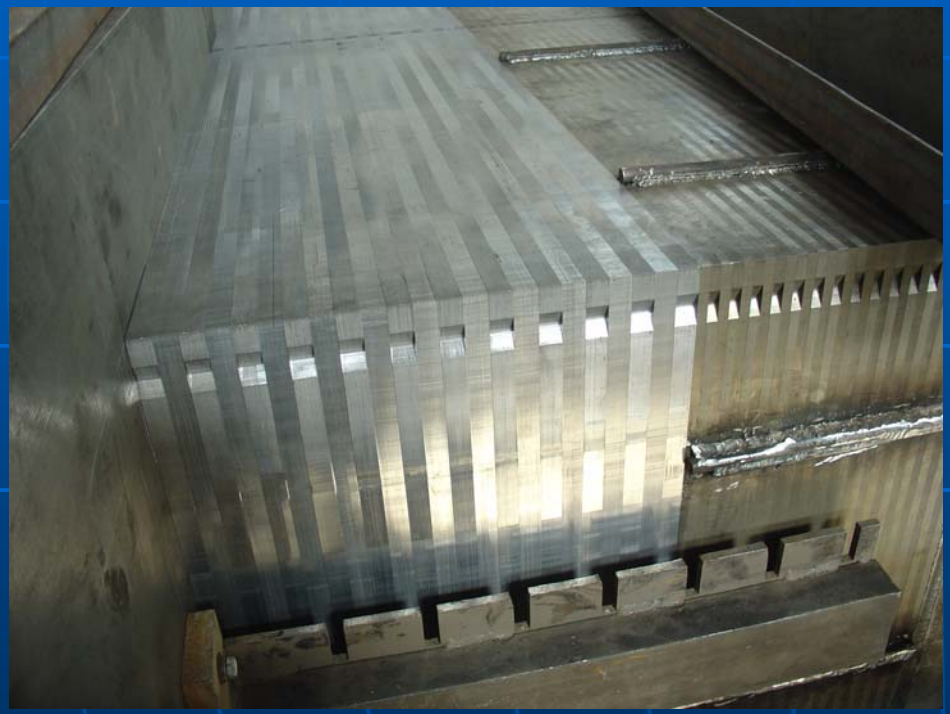
Tolerance of pole of the sheet



Liner about 0.08mm

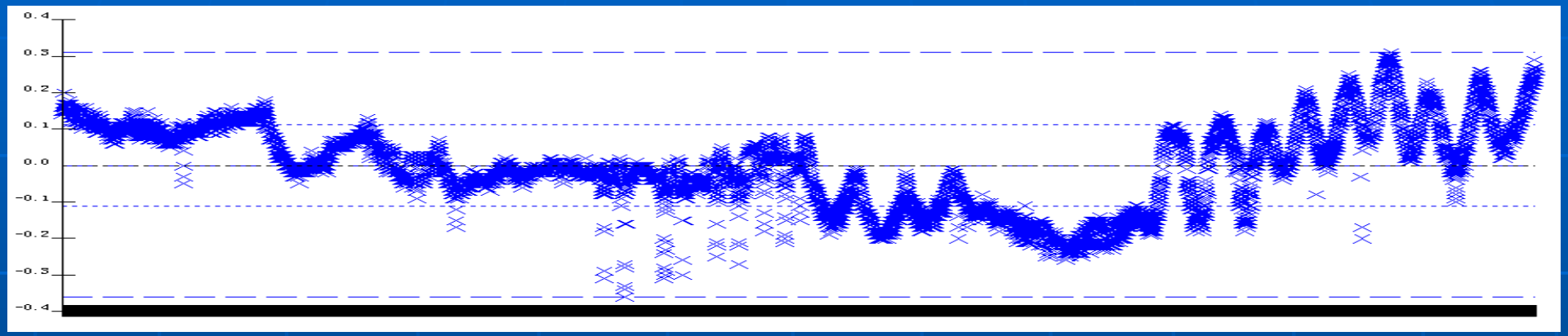
Process of glued block

Laminated half york

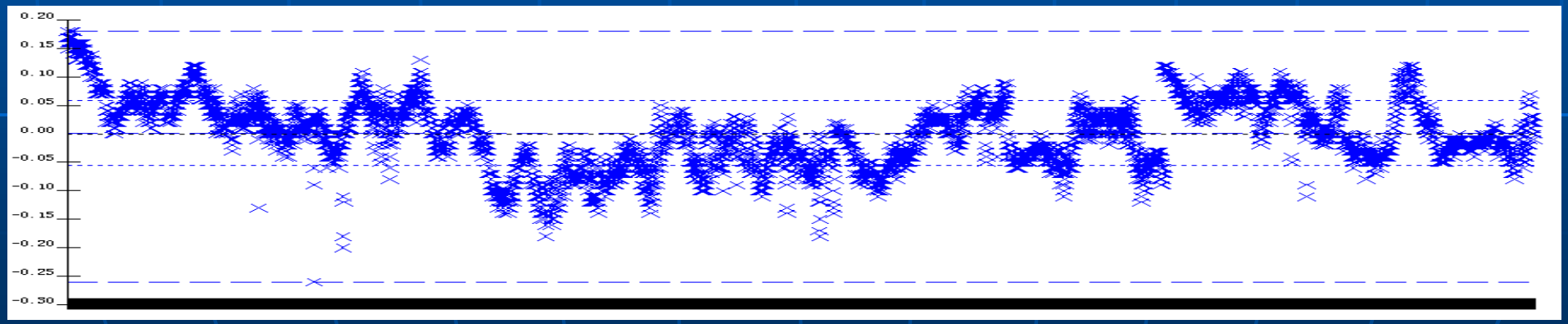


Half york test

Tolerance of pole of york



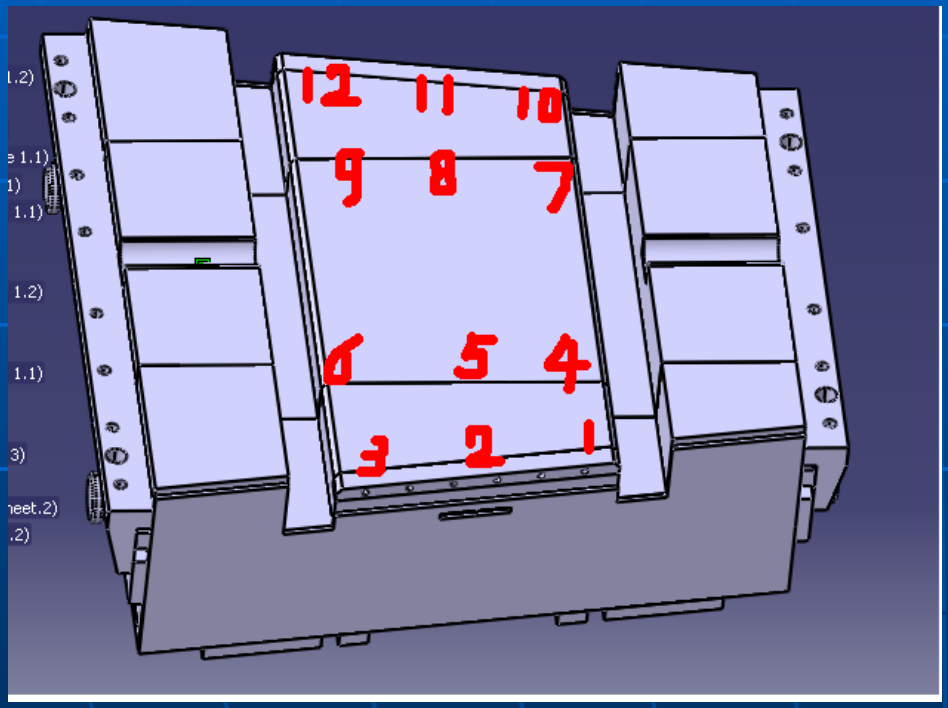
Upper york flatness about 0.20mm



Lower york flatness about 0.30mm

Pre-assembly

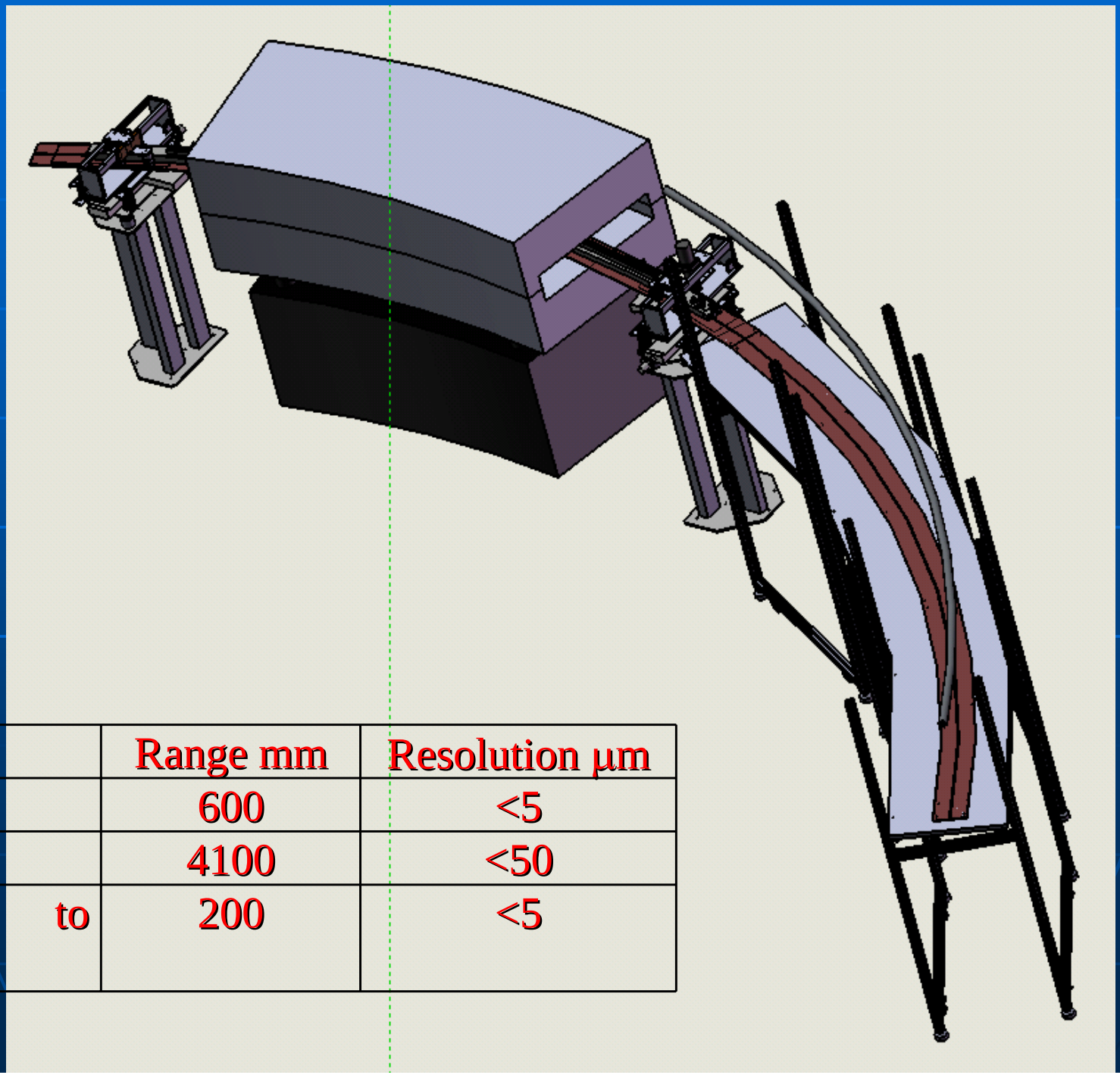
Measurement of gap



	Before adjust	After adjust
1	169.80	170.06
2	169.65	169.92
3	169.83	170.10
4	169.89	169.97
5	169.70	169.92
6	169.80	170.10
7	169.85	169.88
8	169.85	169.72
9	169.85	169.98
10	170.08	170.11
11	169.92	169.99
12	169.91	170.03

Normal coil for low field measurement

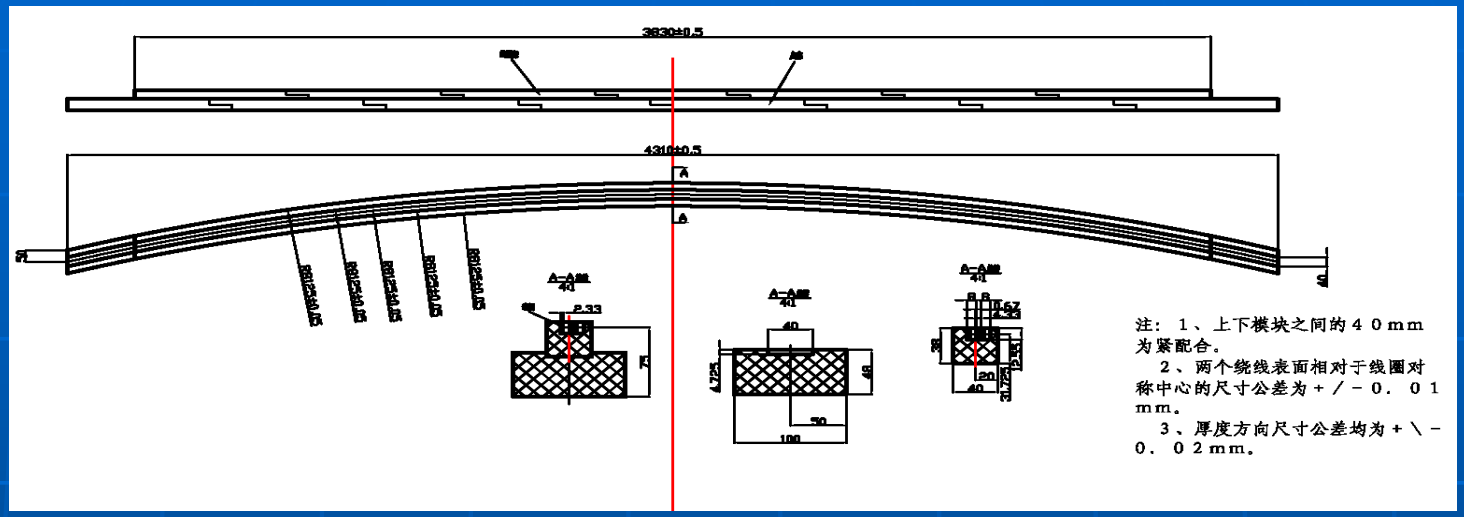
Long coil driving machine



	Range mm	Resolution μm
Transverse	600	<5
Arch direction	4100	<50
Perpendicular to transverse	200	<5

Long coil driving machine

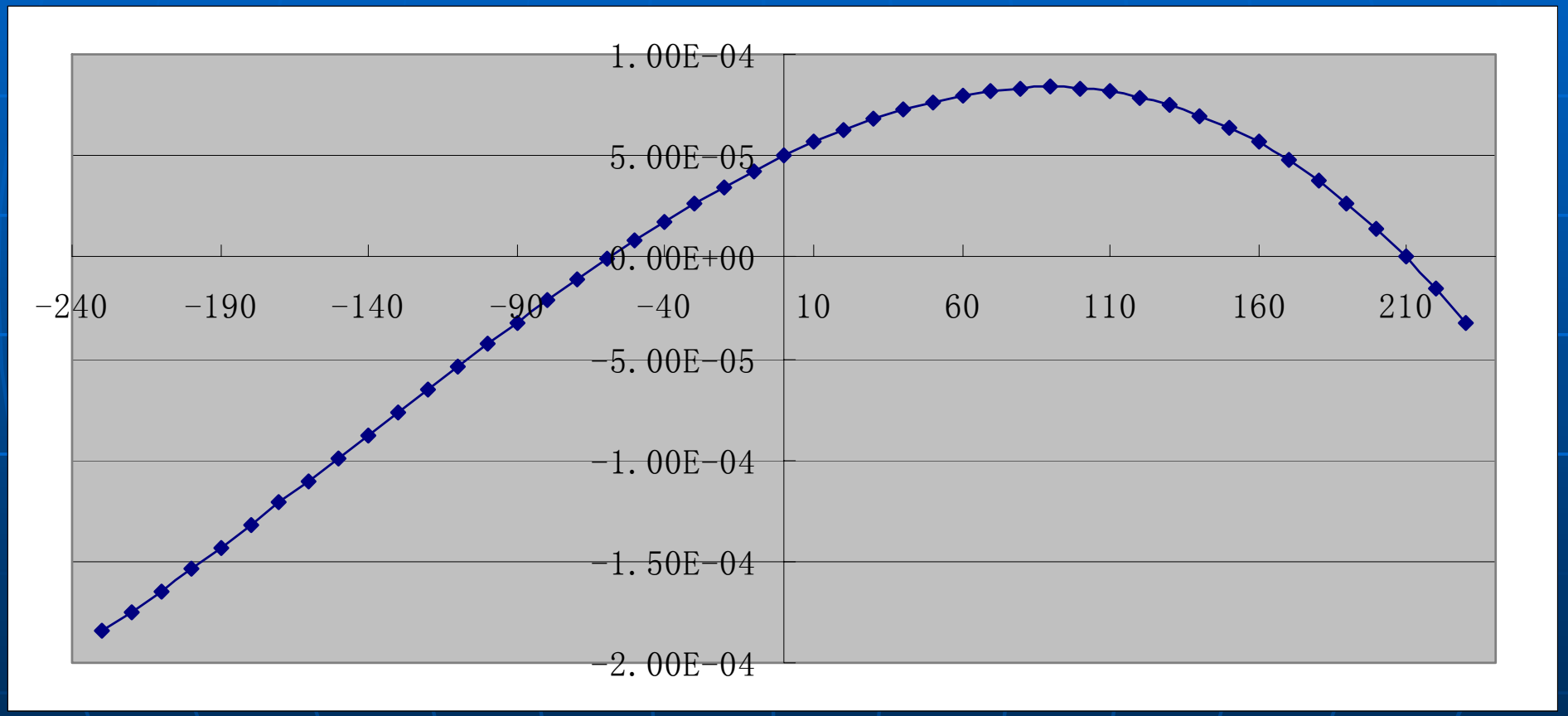
Search coil for the dipole



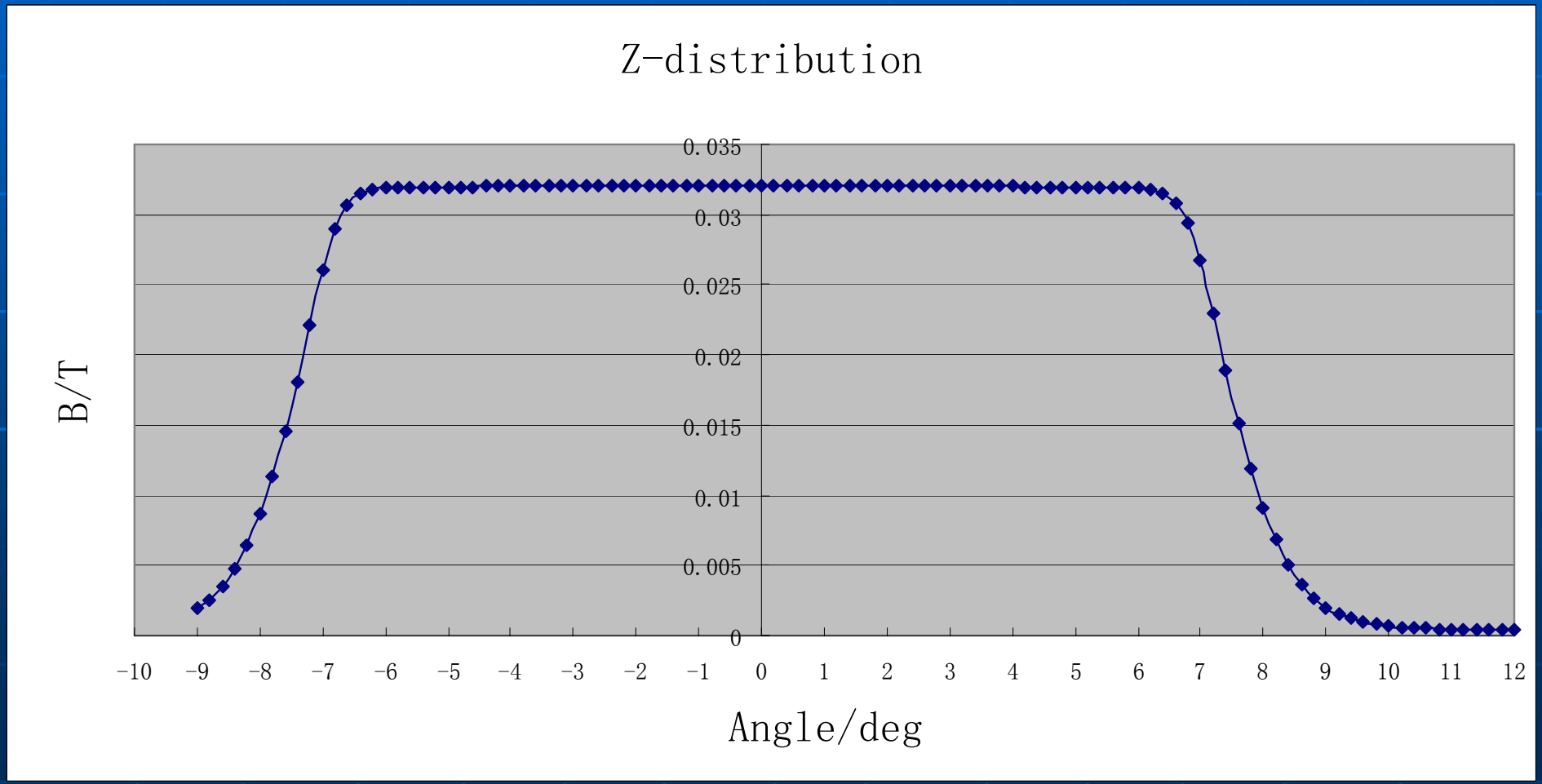
Effective length=3830mm, width=10mm, center higher=85mm, Radii=8125mm

Mapping and integral measure

Mapping Result with normal coil (transverse distribution)



Mapping Result with normal coil (Z-direction distribution)

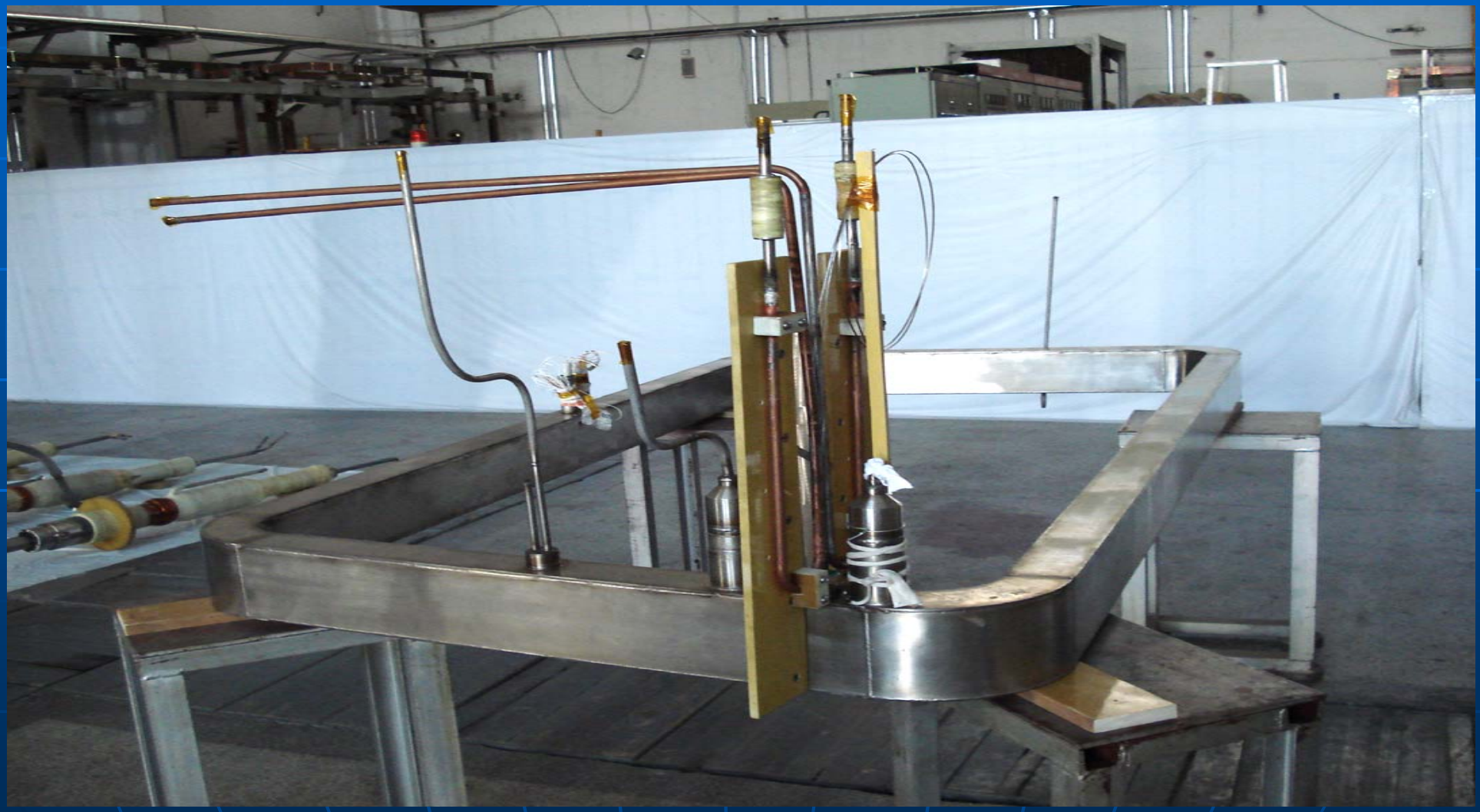


Superconducting coil and cryostat

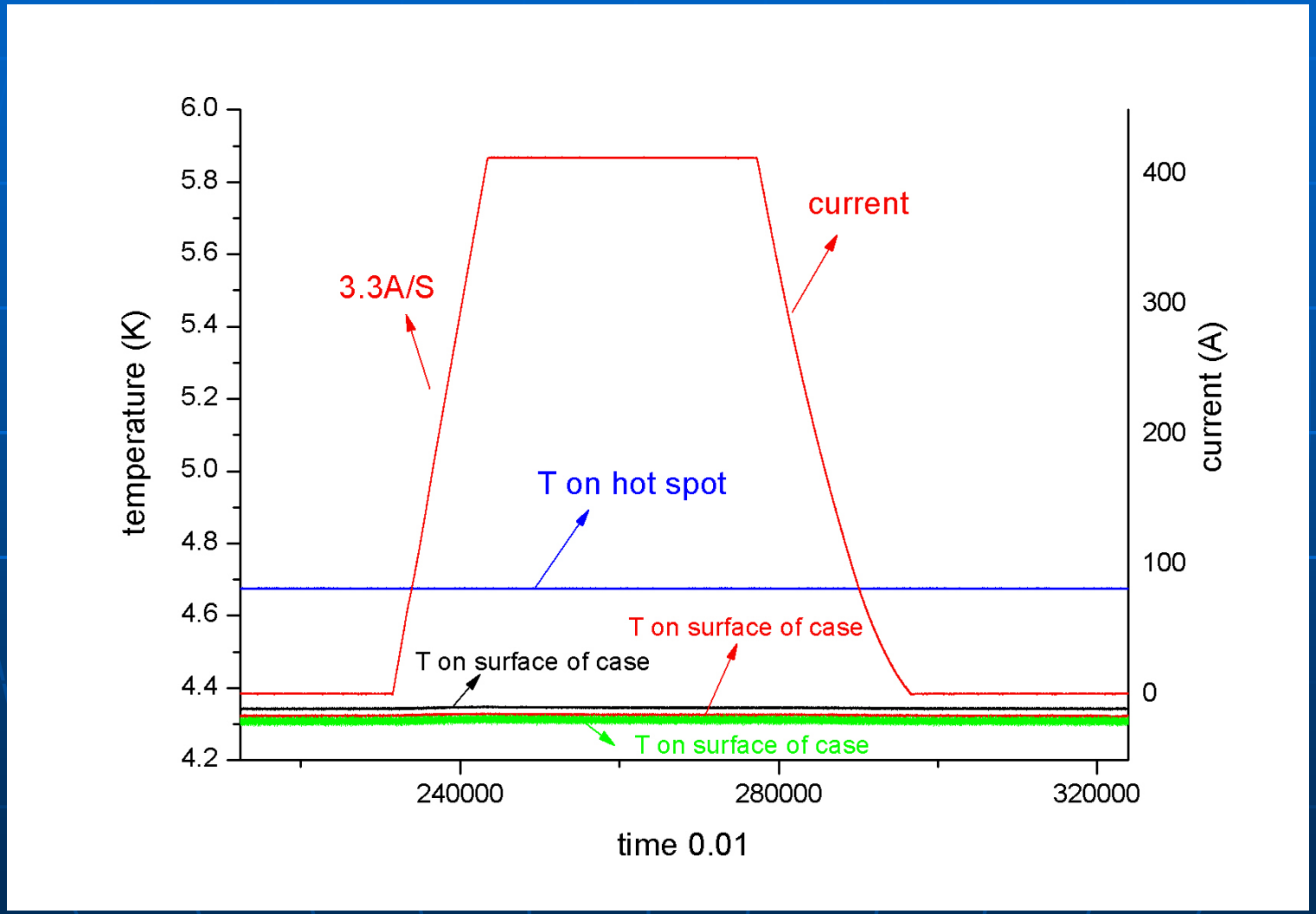
- Superconducting coil is designed and manufactured in Hefei IPP, China.

- After finishing the prototype coil, IPP will modify the mould for the coils of Super-FRS. And this coil will use the same conductor and process as CR prototype.

The Test Coil is Perfect

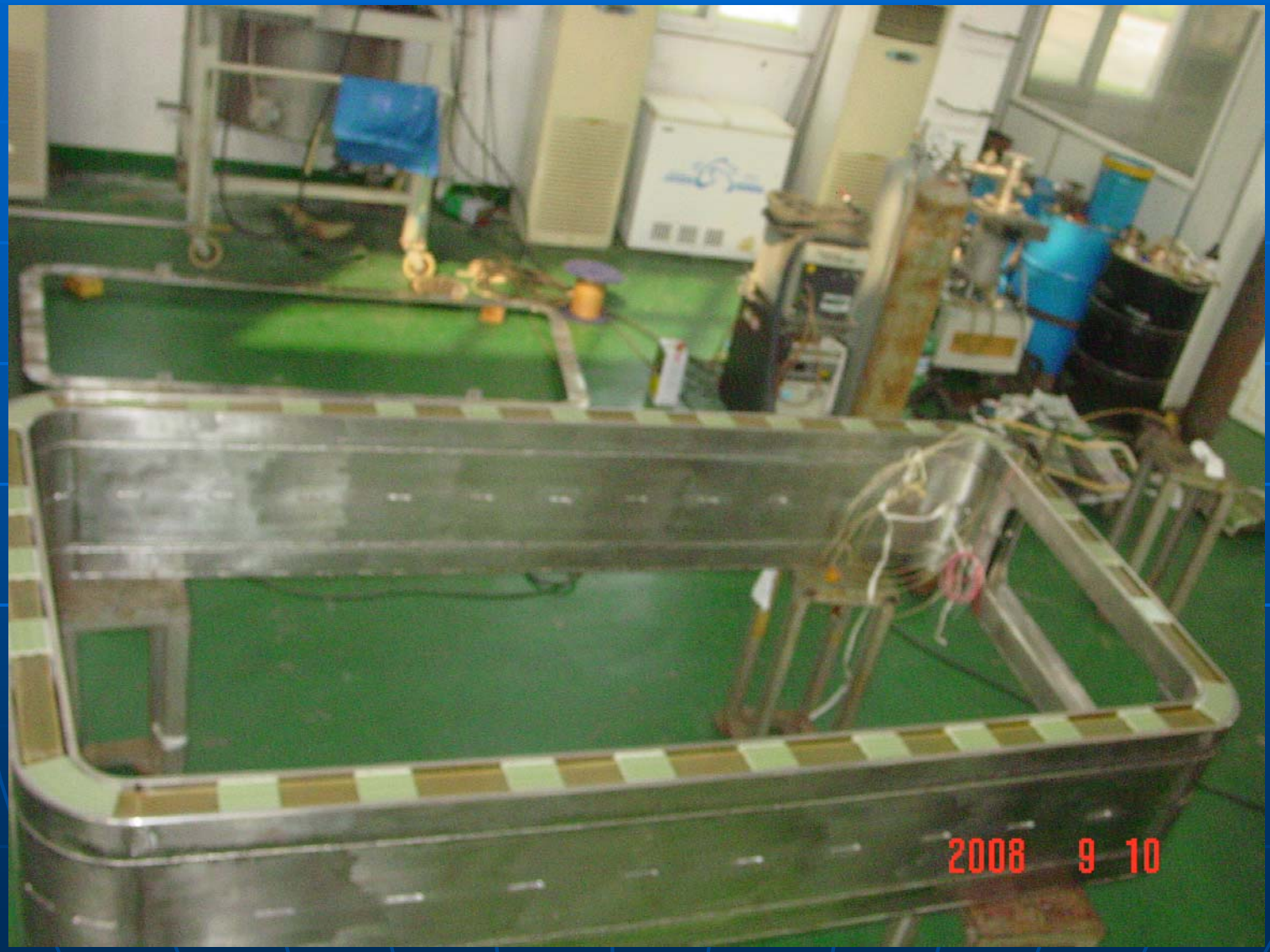


Test Result of The Test Coil



Windings and Case have been finished

Windings and Case have been assembled



Welding the Case (Liquid Hel. Vessel) (Finished and testing)

The Heat Shielding Has been Finished

All parts of Cryogenic finished

About the Coil

- All component has been finished.
- Most test have been done (such as leakage detecting and so on).
- All parts need cryogenic strike (liquid Nitrogen is enough).
- If no big problem, all manufacture work will be done in this month and successive test will be undergo (maybe 1 month).

Summary

- All things about the yoke are going smoothly
- According to the initial mapping result, the magnet has a good magnetic field distribution and can catch the designed parameters.
- The coil will be fabricated in this month and successive test will be undergo (maybe 1 month).
- Sorry again for the delay of the coil.


Thanks