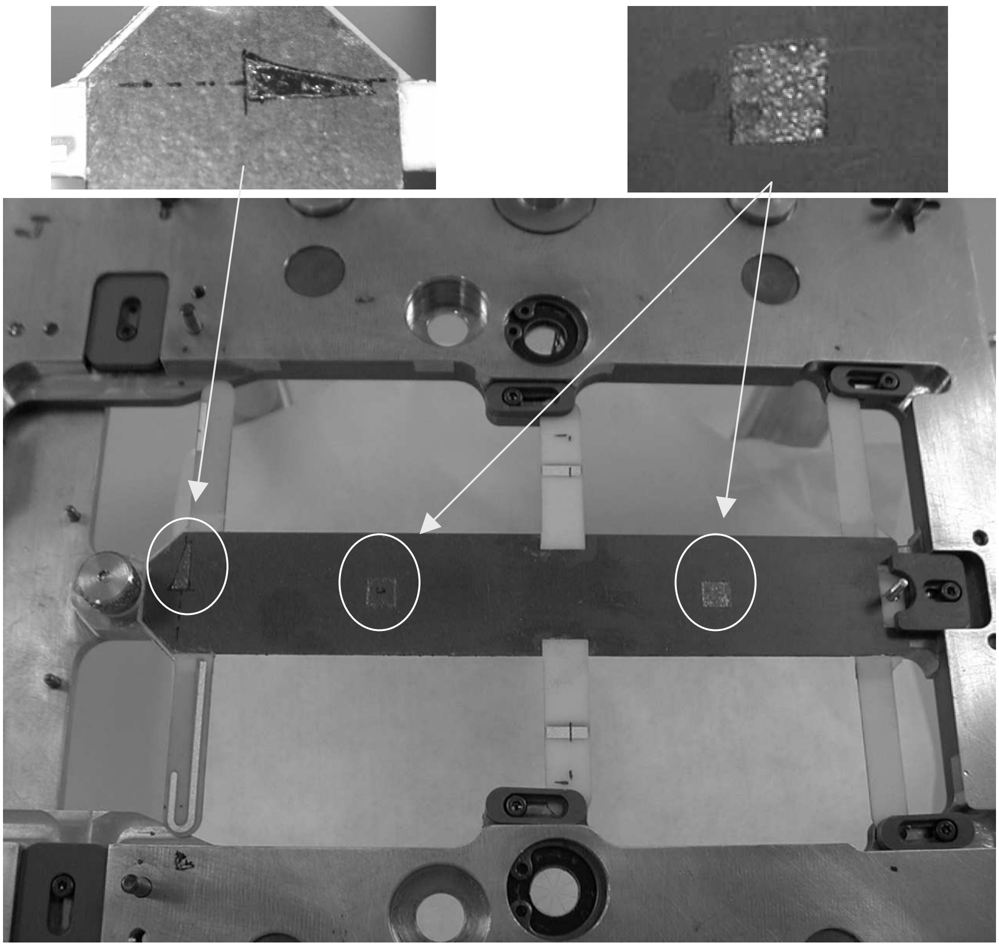
K5 module at Valencia.

We have produced a detector section with Outer detectors glued on a new 23 mm spine.

We also glued the spacers to the spine and tested the electrical scheme, before sending it to Freiburg for the K5 hybrid assembly.

Some work was done in the spine:

- **Open a window to connect fan-in to spine**
- **Cover that 4 openings with non-conductive glue**



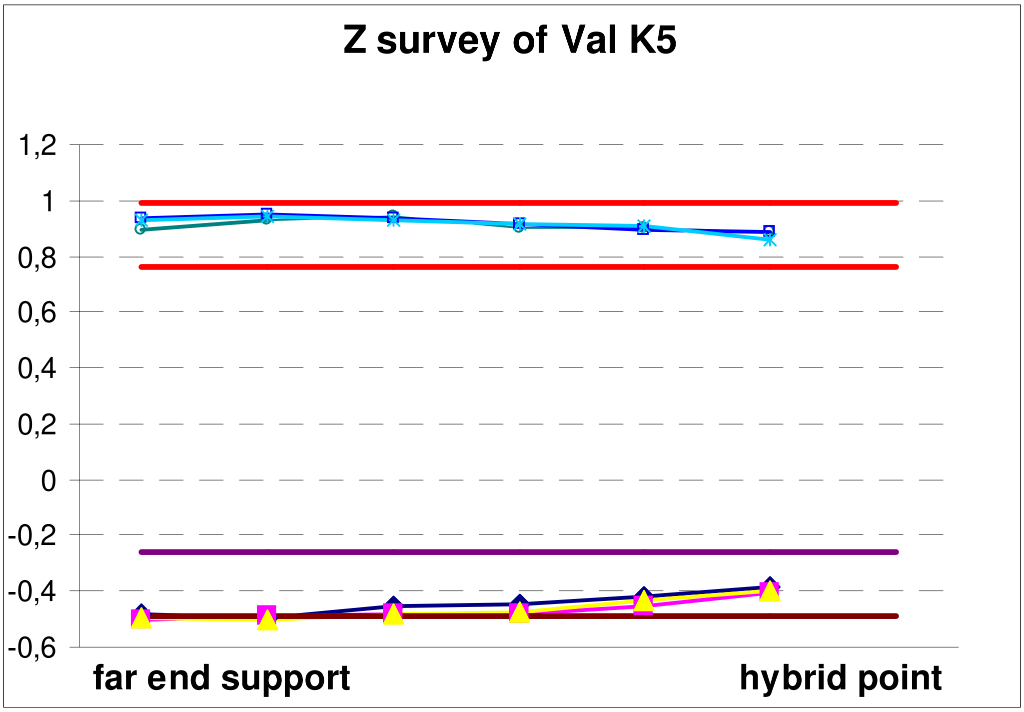
This module has been assembled using the new Labview 5 software and the new Invar jigs.

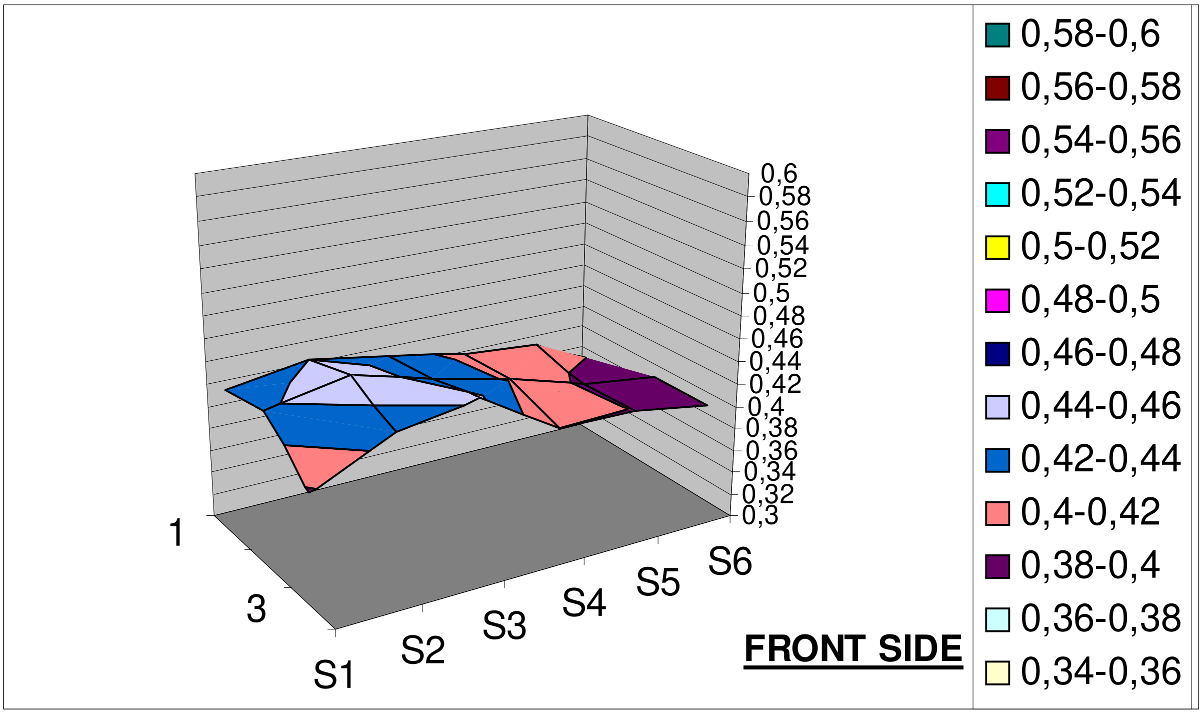
The non conductive glue has been applied on the spine with a robot avoiding any manipulation on aligned detectors.

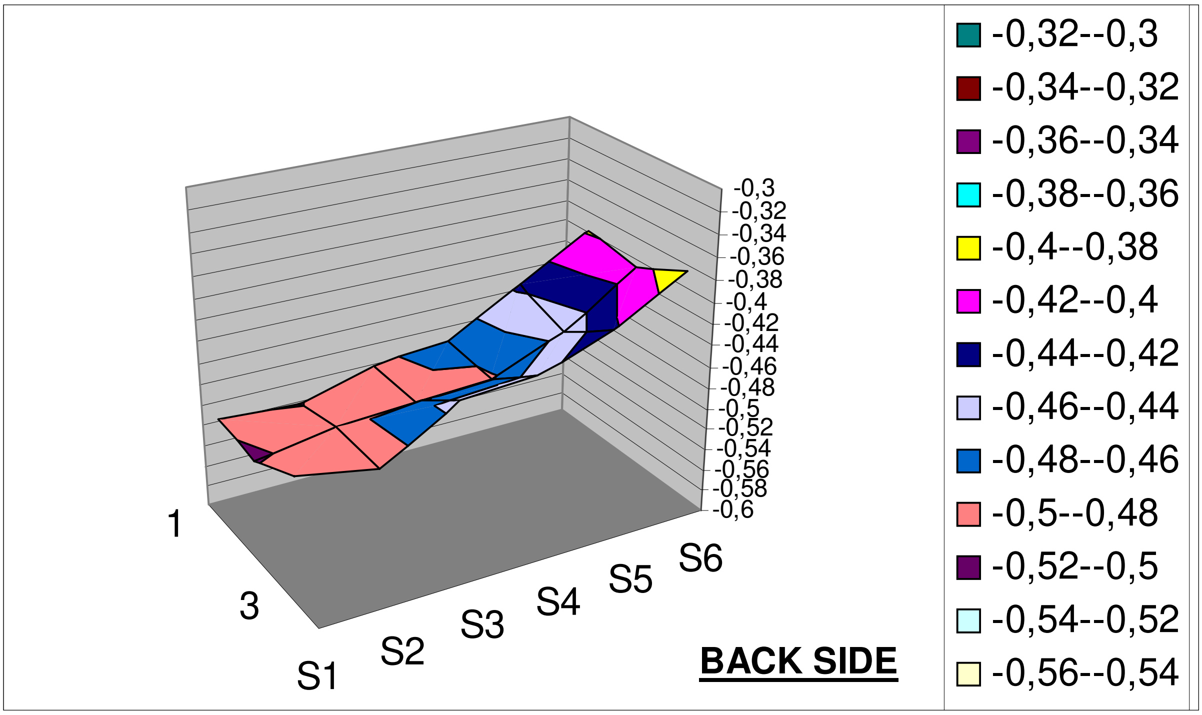
After assembling we did the metrology of the module.

On the XY survey we did not measure the position of the mounting hole and slot but concentrate on the alignment of the detectors itself.

On the Z survey we defined a reference plane with 8 points on the spine and measured the difference from the detectors surfaces to that plane.




0,6
0,58
0,56
0,54
0,52
0,5
0,48
0,46
0,44
0,42
0,4
0,38
0,36
0,34
0,32
0,3
1
3
S1
S2
S3
S4
S5
S6
FRONT SIDE
0,58-0,6
0,56-0,58
0,54-0,56
0,52-0,54
0,5-0,52
0,48-0,5
0,46-0,48
0,44-0,46
0,42-0,44
0,4-0,42
0,38-0,4
0,36-0,38
0,34-0,36


-0,3
-0,32
-0,34
-0,36
-0,38
-0,4
-0,42
-0,44
-0,46
-0,48
-0,5
-0,52
-0,54
-0,56
-0,58
-0,6
1
3
S1
S2
S3
S4
S5
S6
BACK SIDE
-0,32--0,3
-0,34--0,32
-0,36--0,34
-0,38--0,36
-0,4--0,38
-0,42--0,4
-0,44--0,42
-0,46--0,44
-0,48--0,46
-0,5--0,48
-0,52--0,5
-0,54--0,52
-0,56--0,54

– Conclusions

The module is inside mechanical specs except the *midyf* parameter which shows a small deviation .

We need to improve the planarity of the module surfaces and the glue layer thickness.

There has been an improvement in the assembly that has also been observed with dummy modules.

Possible reasons for that improvement:

- New clamping system for the Transfer Plates.
- Automatic glue dispensing.

Status of the assembly and metrology system.

- Status of the assembly

Stages and image packaging are working fine.The latest software version has been used in the K5 assembly. Only the lighting has to be improved.

The design changes we implemented in the Invar jigs seem to work. A new sets of tooling made in aluminium have been produced and will be levelled and tested.

The automatic glue dispensing on the spine is ready and we are setting the routine also for the fanins.

- Status of the metrology machine

We already have the metrology machine in our lab, and we are actually performing the survey on dummy modules in order to fix the latest bugs on the software.

We are also doing an overall calibration of the system using the calibration plate and the interferometer.

Next steps are:

- Check the repeatability of our measurements with the calibrated system.
- Check the routine for finding the centre of the hole and the slot of the module.

Status of bonders + jigs.

We actually have two bonding machines: the KS 1470 and the KS 8090. Both are ready to work.

We wrote a program on the new KS 8090 for the bonding of a K4 Outer module and used it successfully.

We have order a Pull Tester to check the strength of the bonds.

We have a bonding jig made in Teflon which holds the module with vacuum and it has been adapted to be used in combination with the Manchester Handling Frame.

It would be useful to increase the contact between bonding teams to interchange programs, questions, tests and procedures.