

Status of the MPI Module Production



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What has been done recently

The short middle production has been finished.

- 96 modules including 5 site-quali modules have been build.
- 40 are working on disc 8C at Liverpool.
- 38 are ready to use at Nikhef/Liverpool/Prag (26/9/3).
- 3 are within chip/bond (2/1) rework.
- 1 has a negative offset chip, which likely needs to be reworked.
- 3 are site-qualification quality.
- 11 modules are classified failed for various reasons.

The production of long middles is in full swing.

- 158 have been detector-spine assembled.
- 63 have been bonded.
- 45 have been finalised and send to Prag.
- 10 have bad fanins.
- 4 have negative offset chips, which likely need to be reworked.
- 1 final failure, i.e. the module was dropped.

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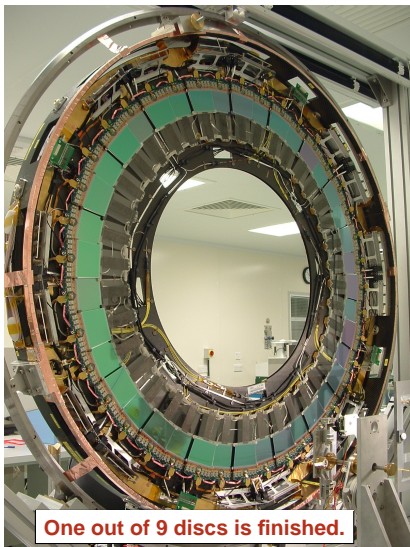
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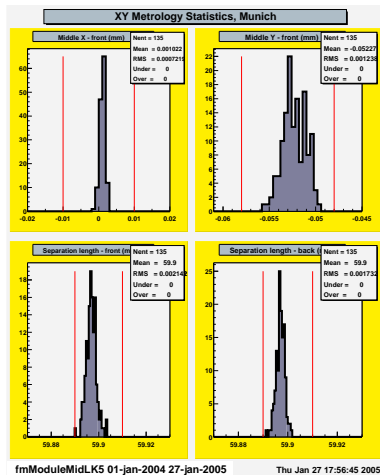
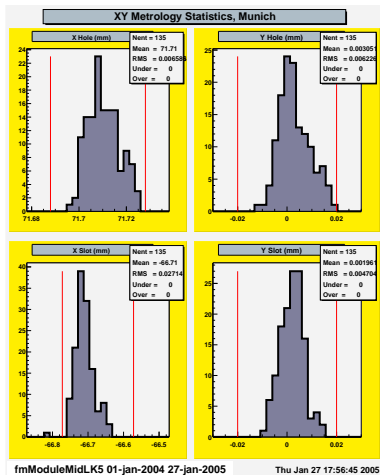
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The production now runs with a rate of 10-12 modules per week.

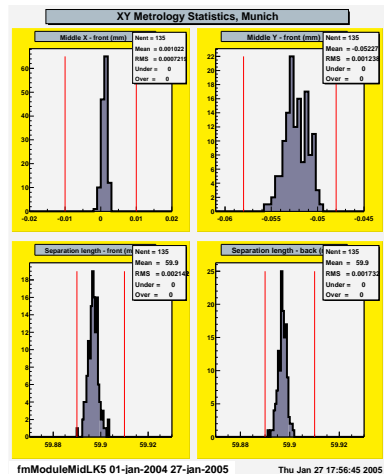
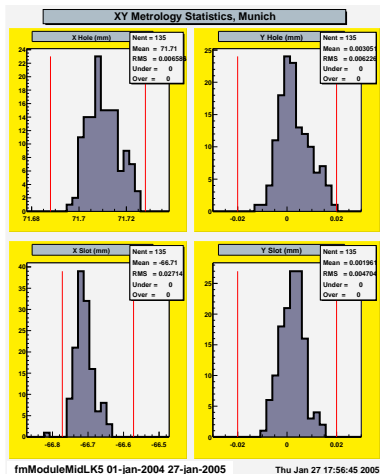
The MPI short middle modules on disc 8C at Liverpool



The xy-surveys of the long middle modules

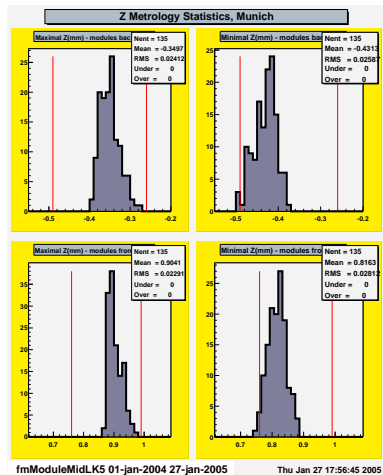
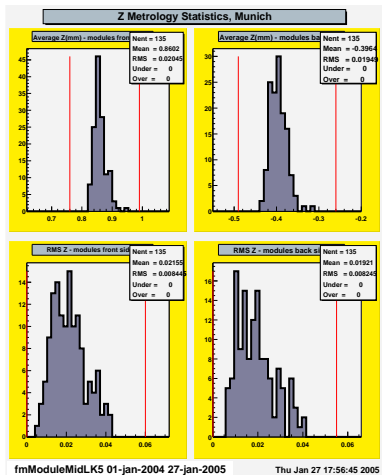


The xy-surveys of the long middle modules

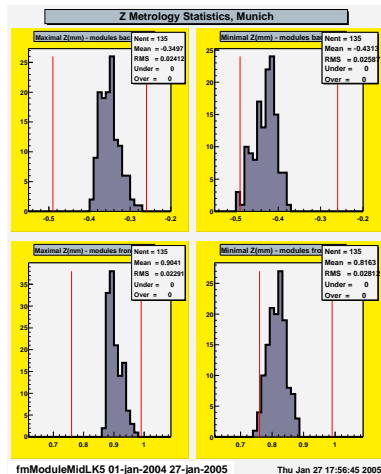
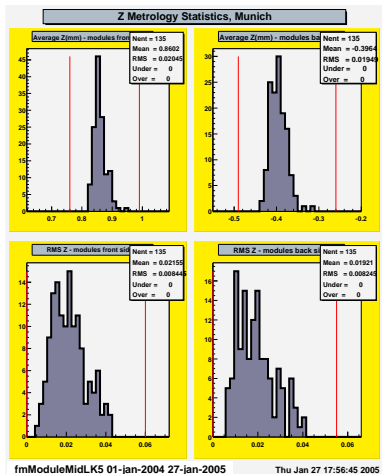


In xy the modules are well within specifications

The z-surveys of the long middle modules



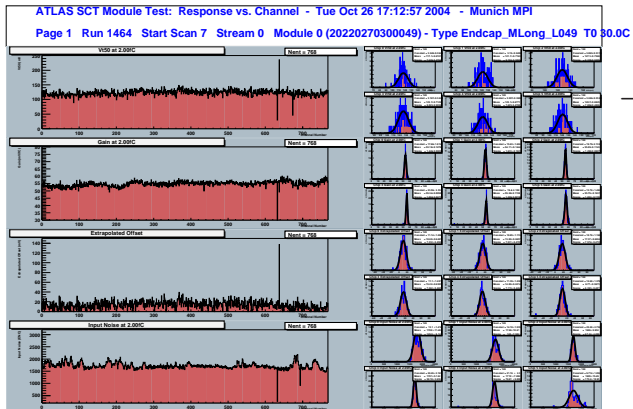
The z-surveys of the long middle modules



Also in z the modules are well within specifications

The noise bump problem is solved

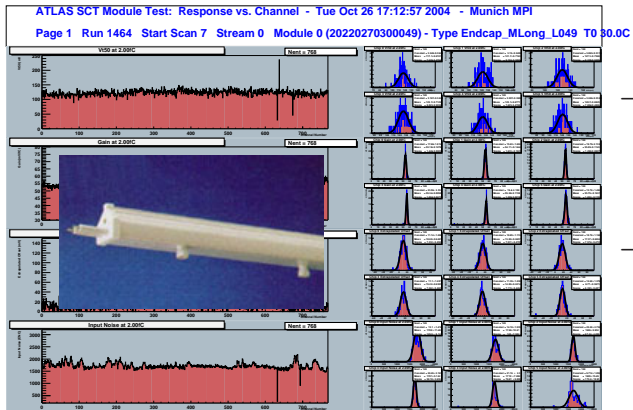
A typical example — L049



- The access noise is caused by surface charge up, either in wafer handling or module assembly.

The noise bump problem is solved

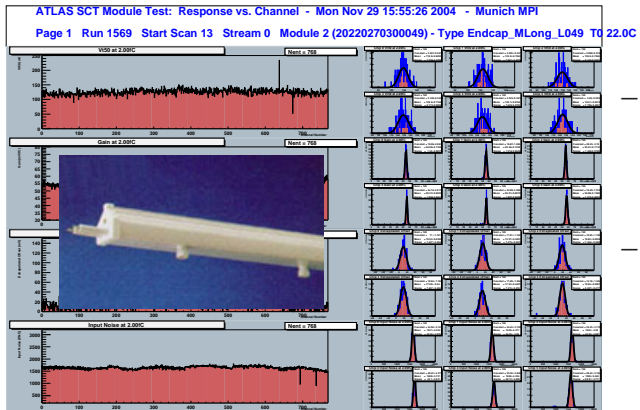
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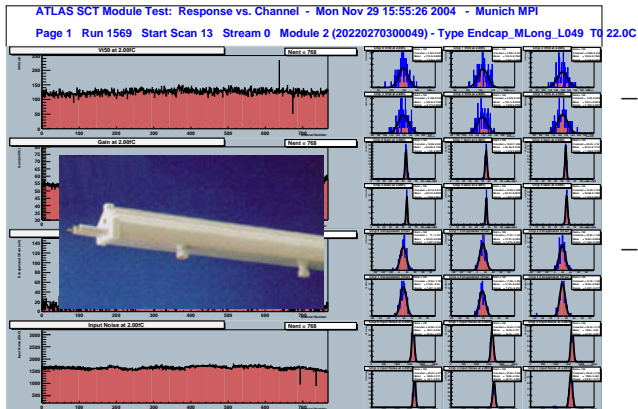
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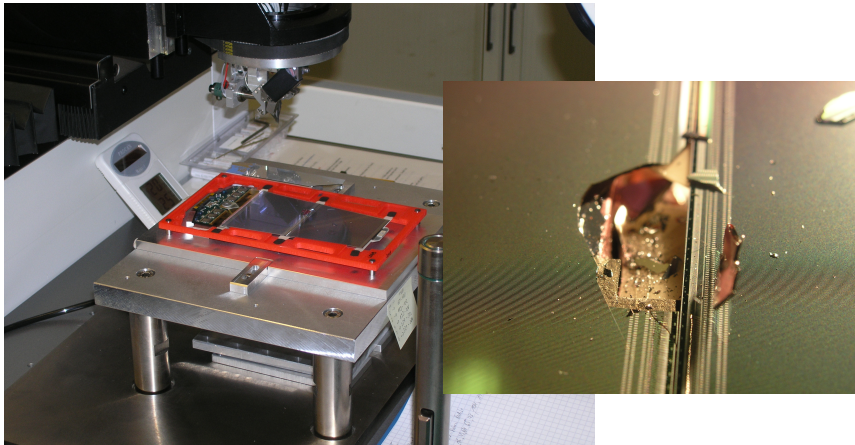


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- A treatment with inoised air solves the problem.

We have a solution at hand but this complicates logistics.

The bond head crash

On December 22, 2004 the bond head crashed through an entire module



Recovery from this accident took a month.

Conclusions and outlook

- Assembly of long modules runs very smoothly, however, **bonding remains a nightmare.**
- We assemble modules with a rate of about two modules a day, six days a week.
- We have built a third set of jigs to even further increase the production rate.
- We employed additional personnel to increase the bonding rate.
- We had Vicki Davis from RAL here for two weeks to help us out and to educate our personnel. This was very helpful and further collaboration is envisaged.
- Help for bonding within the collaboration is not sufficient to catch up. Agreed so far are 5 modules each at Liverpool and Valencia.
- Starting last Sunday, we send modules to the CERN bondshop for bonding, however the time slot is only three weeks, i.e. about 30 of 90 modules on stock will be bonded.
- When the pile of bonded modules comes back, the electrical QA, which is **run solely by students**, will be overloaded. The thermal cycling capacity limits us to 18/week.
- We suffer from insufficient quality of material, i.e. bad bond pad quality on some fanins, negative offset chips on hybrids, and surface deficiencies on the CiS wafers.
- We want to participate in the SCT integration at CERN starting with 1/3 of J. Zimmers worktime.

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We mostly suffer from material deficiencies and the failure of the rented bond machine.