ATLAS BARREL MODULE PRODUCTION AT RAL

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On behalf of the R.A.L. Team

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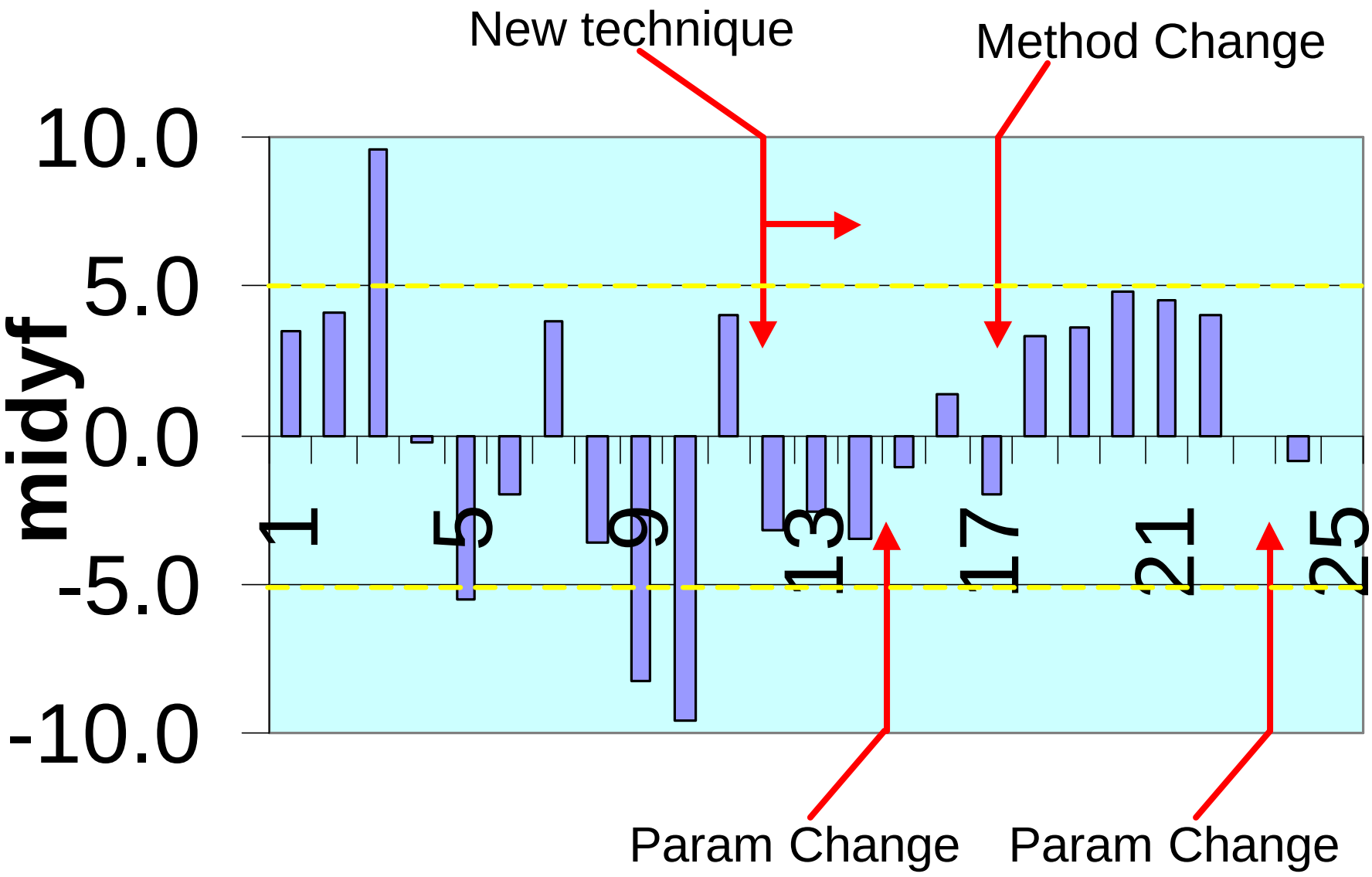
midyf: Situation at end of last meeting etc..

- Problem Controlling midyf parameter to required 5μm
  - Solution: image fiducials on the surface of sensor directly
    - Check alignment prior to gluing top side.
    - Re-align top side prior to gluing bottom side.
    - Check alignment prior to gluing bottom side
    - Tolerance +/- 1μm
  - Discard alignment checking program.
    - This was wrecking the alignment and was too slow.
    - The more we added the worse it got.
  - New procedure works (spread at any one setting is small).
  - However, it consumes a lot of resources (smart-scope) and time
    - Throughput would increase significantly if we dropped these stages (quantification is in progress)
  - We still see residual drifts of sensor (~2-3μm) after build.
  - Solving this problem as we proceed
    - We are developing more understanding all of the time.

History of UK-B midyf



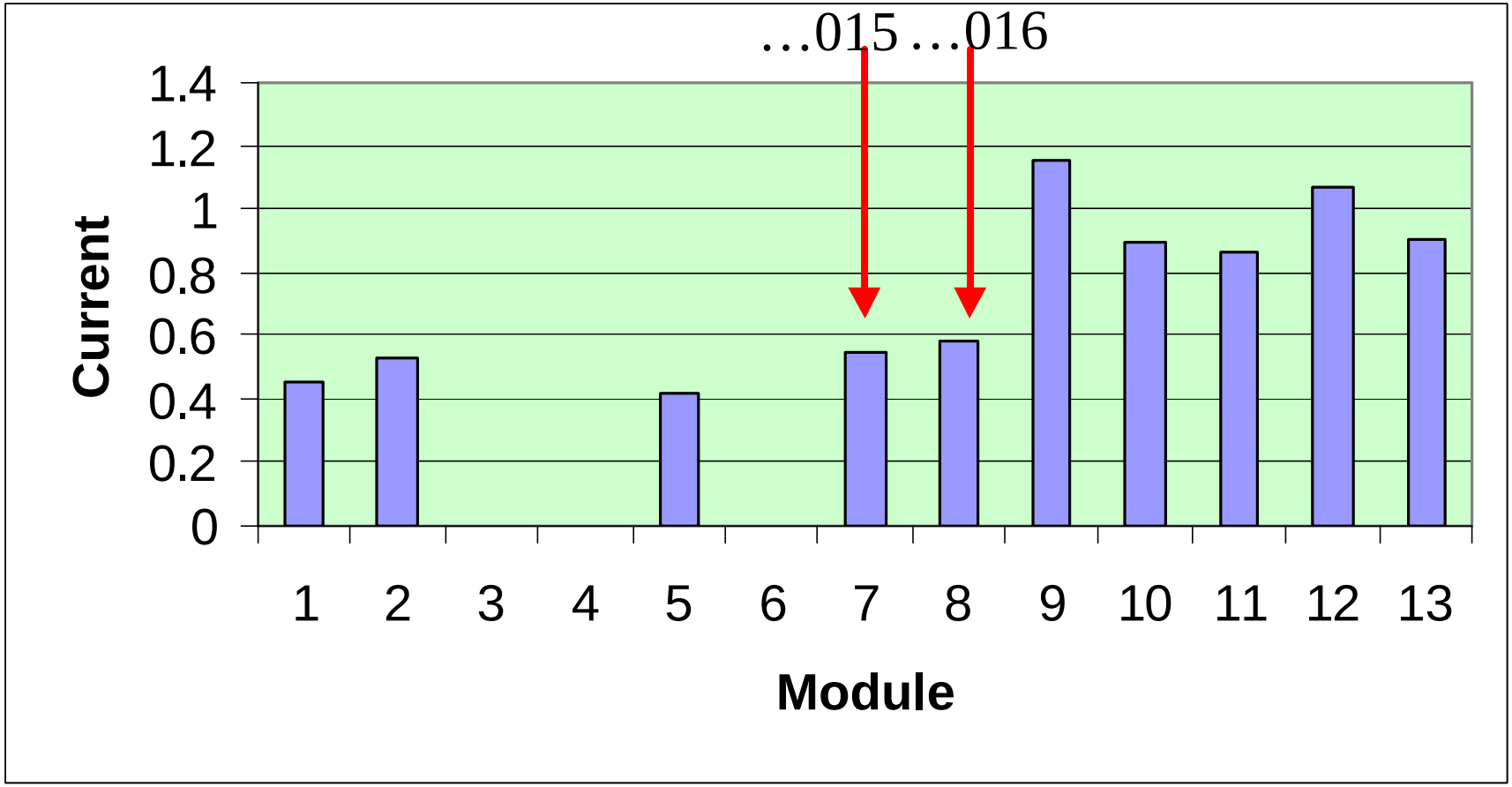
I-V :Situation at end of last meeting etc..

- **Modules were NOT outside spec.**

- However…
- Current Drawn on complete module is not always the sum of the sensors.
- Problem “believed” to be in the area of bonding.
- A lot of collaboration from US and Scand Colleagues (**Thanks**!)
- Change attack angle of bond head (from toe heavy to planar)
- Bond 3 modules in a row with currents equal to sum-of-four.
- Since gained more experience.
  - See plots

- Current Drops as a function of time “after bonding”

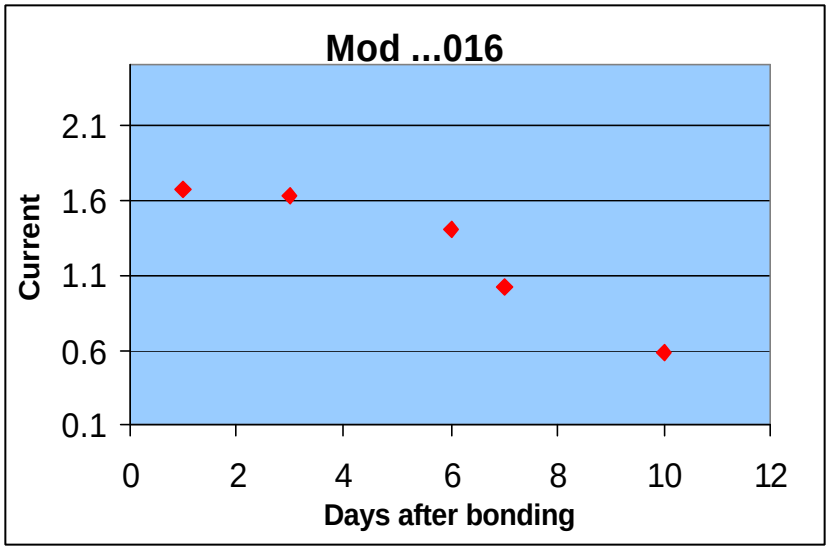
Current Drawn on some Recent UK-B Modules



Results are NOT time ordered

History of UK-B Currents after Bonding

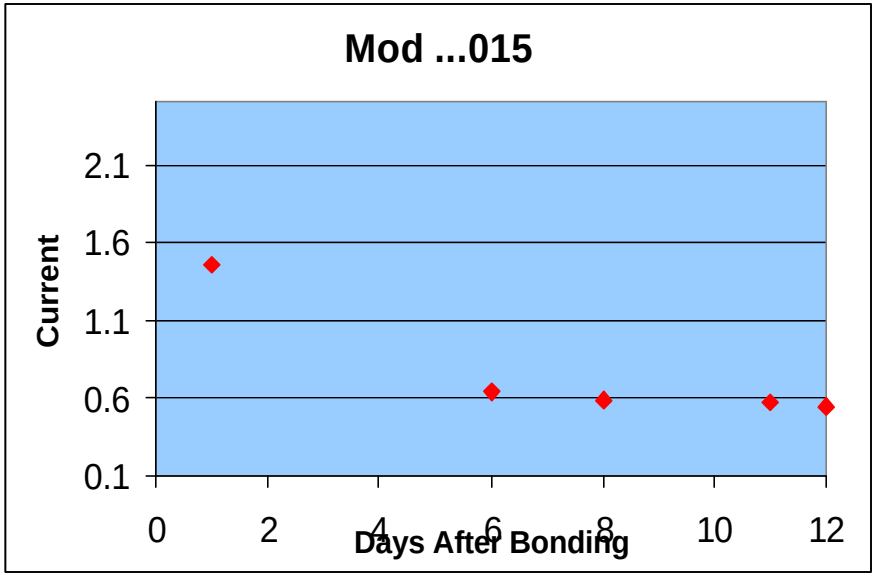
No action is taken the modules are simply stored



Mod …016
Initial I @ 500V = 1.68mA
After 10 days = 0.59mA

Mod …015
Initial I @ 500V = 1.45mA
After 12 days = 0.55mA

Other modules show similar behaviour



Status of Jigs etc..

- 2 Jigs in regular operation (1 / module per day)
- The 3rd jig is now complete is being commissioned.
- Should be done before end of year.

- 2 Hybrid Turn plates in operation
- The 3rd will follow before the end of the year.

- Believe we can do 2 modules / day with some comfort.
- Going to 3 modules / day is going to be tricky.

UK-B Production Update 9.12.02

Module	BB	Hbd	4W.S1	4W.S2	I-V	Mtgy	H.S1	H.S2	Bond	TC	Mtgy	Inspec	Elec	Ship	Status
PR1	…255	…002													FAIL
PR2	…257	…003													FAIL
PR3	…207	…009													FAIL
PR4	…338	…012													OK
PR5	…327	…013													OK
PR6	…181	…011													OK
PR7	…894	…010													OK
PR8	…893	…008													OK
PR9	…896	-													FAIL
PR10	...895	-													FAIL
PR11	…317	…014													OK
PR12	…804	-													FAIL
PR13	…808	…015													OK
PR14	…806	…016													OK
PR15	…809	…018													OK
PR16	…813	…021													OK
PR17	…814	…022													HOLD
PR18	…815	…017													OK
PR19	…816	…020													OK
PR20	…792	…027													OK
PR21	…839	…030													OK
PR22	…835	…023													OK
PR23	…911														OK
PR24	…793														OK
PR25	…913														OK
PR26	…922														OK
PR27	…883														OK
PR28															
PR29															
PR30															

← New build technique

Steve McMahon on behalf of RAL Team . December 2002 . SCT week

UK-B : Some Statistics

- 27 modules started since qualification
- 21 good ones currently in progress
- 6 early ones modules put to one side
  - 4 failed metrology (**NO failures since adopting new midyf technique**)
  - 1 accident & 1 Misplaced Hybrid
- 1 Chip failure (last few days). To be reworked.
- 7 modules complete
- New smart-scope being commissioned
  - Final Parts arrived mid last-week.
  - First analysis in progress.
- Expect 9 more completed modules this week.

UK-B Production Status : Conclusion

- UK-B Moving cautiously into series production
- Currently doing ~1 module per day on 2 sets of jigs.
- Holding the midyf tolerance
  - There is a significant (in time and resources) overhead in doing this.
  - We are improving our understanding of its control as we go.
- Modules undergoing LTT in Universities.

- Improved current draw and observe decrease in time after bonding.

- Commissioning of new smart-scope is underway.
  - Complete in next few days
  - Clear backlog of modules (~9) in coming days.

- The next production jig will be ready within a few days.
- The remaining 3 sets of jigs will be ready early in the new year.