

CALICE: WP4 Thermal and Mechanical

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Programme as sent to PPARC

• Mechanical

- Learn about glue types and properties
- Simulate aging by thermal cycling
- Prototype assembly procedures for placing wafers on boards, gluing in place and making electrical connections

• Thermal

- Simulations of heat flow in detector
- Measurements to complement simulations
- Look at cooling methods and devise schemes as appropriate

Glue Studies

- Work started (Ray Thompson, Julian Freestone)
- Literature being looked at
- Glue currently used is Epotech E4110 (used by GLAST)
- Would like to know about expected radiation levels in the detector - any information?
- Aim to wrap up by end of this year

Glue studies: aging

Thermal Cycling

We have the
programmable oven

Work upset by lab
removals (now and
again in Spring)

Some results by end
of this year



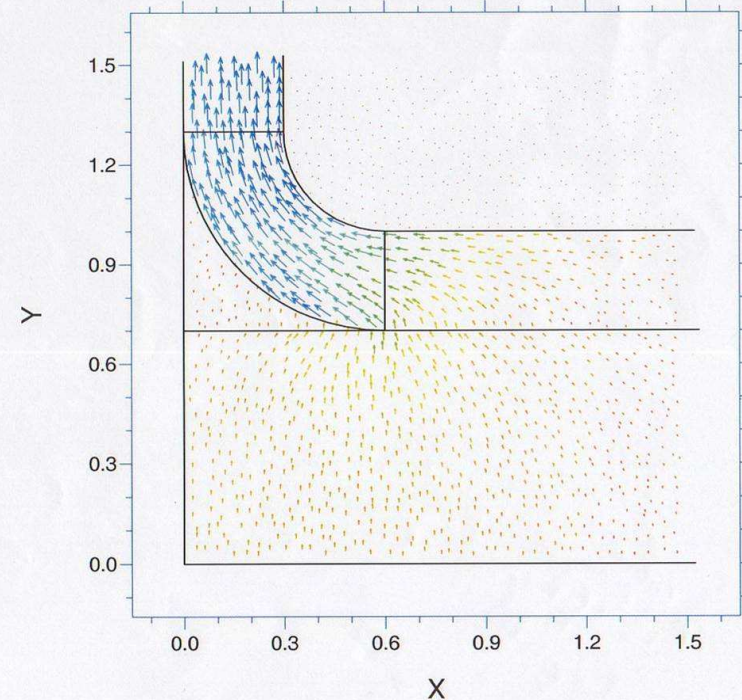
Heat Flow

Simulations by Steve
Snow

3-D licence bought
for software
(FlexPDE)

Need to establish
what to simulate.
Technical drawings
of framework.
Failed to locate so
far - any offers?

ipd-pde-LC-ECAL-v100.pde



ipd-pde-LC-ECAL-v100: Grid#2 p2 Nodes=407 Cells=184 RMS

Still to come(1)

Thermal Measurements to complement and inform simulations.

Measure outputs from pads and other on-board electronics and compare with datasheets

Mock-up of detector with lots of thermistors to measure temperature and resistors to simulate heat production

Still to come(2)

Cooling: whether we need it, what's being used, can it be improved (concern with cost, safety, adding dead material)

Need more experience and input from collaboration

Still to come(3)

Conceptual design and prototyping of assembly procedures for 24,000,000 pads (wafer handling, co-ordinate recognitions, wafer placement).

Cameras and pattern recognition and robots.

This was squeezed by PPARC - what do the collaboration want?

Summary

We are very limited by manpower. Squeezed by PPARC and ATLAS ring fence. 10% of Ray, Steve, Julian and 2 Technicians

- This year:
 - Glue studies
 - First aging measurements
 - First thermal simulations
- Next year
 - Aging measurements
 - Thermal simulations routine
 - Thermal measurements
- Sometime/never
 - Cooling design
 - Assembly robot