

Gunn Diode Oscillator Minutes

David Headland

2004-05-06 10:00

Attendance

- Fourth year students:
 - JM Higginbotham.
 - R Wan.
 - DP Headland.
 - MP Gaskill.
 - AJ Nelms.
 - RE Irwin.

- UMIST staff:
 - WS Truscott (11:15)
 - R Sloan (11:15)

Approvals

- The minutes from the last meeting were approved.

Power supply

- Problems have been observed with the voltage dipping.
- Different programs have been tried with no success.
- It will be tried with a commercial oscillator, but it's not expected to work.
- A large capacitor will be tried to smooth this out.
- Take everything to the demonstration even if it isn't fully functioning.
- Take an oscilloscope to show the dip.
- Be ready to explain the dip if questioned.
- The computer can still be used to monitor the voltages.
- Get two computer controlled channels working if possible.
- The third channel can use a potentiometer on the reference.
- New PSU deadline has been set: Wednesday 2004-05-12.

Miscellaneous

- Required work on the project should stop 7 days before the first exam.

Simulation

- The Maltese cross model has been received and imported.
- It isn't solid at present.
- It's coordinated cannot be easily set.
- Assistance from WS Truscott will be sought.
- Perfect results are not expected from this model.
- We could model the final radial line transformer.
- This model could then be shown at the demonstration.

Demonstration

- Currently, MP Gaskill is trying to organise props.
- A name tag has been completed.
- This tag can be used as a template for other name tags.
- Simulation pictures will be required for the display.
- The format of the demonstration was discussed.
- Ideally, we would demonstrate a single diode oscillator followed by an n -diode oscillator.
- Practically, we may be better demonstrating the combining oscillator then replacing it with the single device oscillator whilst other areas of the project are being demonstrated.
- We could use e2v's commercial oscillator if required.
- We may want a computer running HFSS at the demonstration.
- Martin Edwards and Dave Armitage will be marking.
- They will mark well for engineering content.
- We will need to talk about how we managed e2v.
- It was suggested that a dummy demonstration takes place with the equipment on E floor.
- This trial will be useful for timing purposes.
- We will need to find out about calibration from K Williams.
- A good way to do sections of the presentation would be to have one person talking and another practically demonstrating.
- Interactions will show that both understand the process well.
- Power combining and simulation are ideal section candidates.
- 3-4 speaking parts was suggested as possibly optimum.
- It should be clear in the management section what everyone's primary role is.

-
- Questions are always asked on project management.
 - Don't be afraid to cut parts that don't seem up to scratch.
 - It's not a problem to say that certain parts couldn't be investigated as far as we would have liked because they were more involved than initially anticipated.
 - Questions are likely to be asked on the functions of:
 - The resonant disc.
 - The radial line transformer post.
 - Always have a strategy for failure.
 - Try n times then skip it and come back if it's working before the end.
 - Video can be used as a last resort.
 - The markers will have seen previous presentations and reports.
 - Starting with a working whole systems is a good idea.
 - This can be taken to bits afterwards to show how things work.

Poster

- Example templates were distributed.
- The formats were discussed.
- The content has not been finalised but is being worked upon.
- Previous years' posters are kept by staff in B21.
- Check the contrast between colours rather than actual colours.
- Background pictures were suggested.
- Perhaps a photograph of the large scale Gunn diode model?

Awards ceremony

- Team working awards ceremony this evening.
- Meet outside Kro Bar near Dover Street at 4:50.
- Dress code is smart/casual.

Epilogue

- RE Irwin will post an example epilogue structure soon.
- This should be commented upon by all team members.

Testing

- We may be able to try to optimise the device configuration.
- The front diode is in a cavity stopped by the back diode.
- Comment upon this in the epilogue.
- The cavity length affect frequency, so will relative diode positioning.

Published paper

- There is a possibility of a paper being published based on the project.
- This would require graphs that tell a story.
- We would need to know:
 - What changes the frequency of each diode.
 - What frequency range locking occurs within.
- The team would publish the paper.
- Ana electronics letter would be preferred over a journal paper.
- Letters take less time to be approved than papers.

-
- Feedback from letters is either a will or won't publish.
 - Can state something like "a paper is in preparation on the basis of the project" in the epilogue.
 - We probably would get many extra marks for this.
 - If we are in a position to do this, we should do so, but should not spend a disproportionate amount of time on it.

Closing the project

- The project must be closed after the demonstration.
- Simulations should be burned to CD.
- WS Truscott and R Sloan should receive a copy each.
- We can keep the equipment if we need it for writing the paper.
- When finished, equipment should be returned to WS Truscott.
- UMIST will keep the equipment until they no longer need it.
- After that, it will be returned to e2v for their own use.

Proposed actions

RE Irwin	Mail the draft epilogue structure in.
DPH, AJN	Try testing the multiple device oscillator with two PSUs.
MP Gaskill	Check the presentation board sizes.
JM Higginbotham	Send interesting simulation pictures to MP Gaskill.
DPH, AJN	Check with K Williams about the calibration process.
R Wan	Acquire a digital camcorder for critical tests.
DP Headland	Sort out whiskey at \approx £10/bottle.
R Wan	Send a photo in for inclusion on the project web site.

DP Headland	Look into getting aluminium foil for shims.
All	Start thinking about what to say in the demonstration.
DPH, AJN	Check that we can have test equipment for the demo.
DPH, AJN, RW	Continue testing the PSU: D floor lab, 1:30 Monday.
MP Gaskill	Provide mechanical drawings for the demonstration.
RE Irwin	Ask Pauline Bradshaw for poster templates.

Next meeting

Time Thursday 13 May 2004, 10:00.

Place D2c coffee room.

Meeting adjourned, 12:33.