

PhD project – lessons learned

Looking back at my thesis time – evaluating progress, strategy & schedule

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Background

- > Next students coming
- > You are/might be supervising
- > You are being supervised

- > Everyone supervises also him-/her-/themselves!

- > No guarantee of completeness
- > Subjective analysis

Orientation help
in talk:

Aspect of project

Details on (my)
work

Recommendation

Dissertation starting point

(More or less) coarse goals & schedule

> Started in May 2017 – defended November 2021 → 4 years 6 months

- > No parental leave, illness etc.
- > Full time was active working time

> **Goal:** Development of scheme to measure slice emittance

> Slit-scan-based approach

> Quadrupole-scan-based method

First steps done by Holger

Not done routinely

> After first orientation phase I started working on quadrupole scan (~ 5 month)

> No clear results could be obtained from the analysis

In the end: This didn't made it into thesis:
But was on schedule for 18 month

→ If possible: start with 'safe bet',
be ready to switch focus

Overall goal

Problems on the way

Dissertation in experimental physics

> Work on slit-based slice emittance scheme

- > Simulation of slit scan
- > However: Shift experience was lacking due long shut down
- > Some progress, but rather slow and lacking experimental context

~7 month after start at PITZ

Shift agreement not ready from Day 1
Later Gun exchange shutdown
→ < 22 shifts done in first 11 month

→ From start: Focus on
machine/measurement experience

> Technical failures:

- > Gun4.6 (conditioning started in April 2018) high dark current
- > TDS klystron filament damage

→ 7 months delay

→ 9 months
delay/difficulty

Measurement data is most valuable:
Put priority on taking data

Simulation of
experiment

Acts of nature
beyond control

Problems on the way

Dissertation in experimental physics

- > **Presentation** of research results
 - > Either simulation data/general ideas
 - > (Semi)-analysed measurement data
 - > Simulation data

→ Present your status frequently:
You'll rarely have 'everything' ready

PPS, PhD seminar, PhD report,
K'n'K seminar, DPG spring meeting,
Collaboration meeting

Follow-up on meeting: Is it good for
publication/thesis? General idea
good, but implementation insufficient

Presentation of
data analysis/work

- > **Thesis writing**
 - > Generally: Start early with writing!
 - > However: Better to have data analysis ready

Thesis writing

- > Work during thesis extension
 - > Develop proper roadmap with supervisor

Note: Development of roadmap
impossible at beginning for student

Work during
Extension

→ Stick to roadmap

Recap

How much time (could have been) saved (for a PhD student)?

- > Gun exchange shutdown & bad Gun lead to break
 - > 13-month long period without measurements
- > Over-ambitious goal → Find good balance between novelty and safety
 - > For me: Early focus on quadrupole based option
- > Follow-up after presentations: Status of work → What else has to be done?
 - > More detailed simulations & analysis needed: 1 – 2 month extra work
- > Stay flexible with research goal
 - > Perhaps less measurements are sufficient for goal?
 - > For me: Three laser pulse shapes
- > Most importantly: Stay conscious: Where am I, where do I want to be?
- > Meet frequently in year 1

~ 6 – 9 month delay

Contact

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