

COLTRIMS Training Program

Goals:

- get familiar with the COLTRIMS technique within 2 to 3 months
- learn how to setup and operate key elements

Infrastructure:

- Location: Institut für Kernphysik, Max-von-Laue-Str. 1, 60438 Frankfurt am Main
- AMO group: 2nd floor, <http://www.atom.uni-frankfurt.de/>
- Mentor Team: Till Jahnke, Markus Schoeffler, Joshua Williams, and Lothar Schmidt

Basics:

- you should be present at the lab on at least 2 days a week for more than 2 hours each. Ask the Mentor Team to assign you a shared desk if needed and arrange for computer access and lab keys.
- follow this guide, approach your Mentor Team with questions, get to know as many students and projects as you can, help others with planning, simulating and setting up. Train yourself by shadowing others. Don't hesitate to ask questions.

Homework:

- read about the fundamentals of the experimental setup like: vacuum chamber, supersonic gas jet, position and time sensitive detectors, momentum imaging spectrometer, Helmholtz guiding field, and electronic readout (pulse decoupling boxes, fast amplifiers, constant fraction trigger modules, time to digital converter). Suggested thesis's are:
http://www.atom.uni-frankfurt.de/publications/files/Trinter_2011.pdf
http://www.atom.uni-frankfurt.de/publications/files/Tilo_Havermeier_2010.pdf
http://www.atom.uni-frankfurt.de/publications/files/Felix_Sturm_2009.pdf
- work with an existing spectrometer simulation project using Excel (COLTRIMS.xls) and SIMION. Come up with a new simulation for a future experiment. Learn how to extract critical design parameters like max. electron energy and kinetic energy release from the literature. Contact the Mentor Team to provide you with templates or to refer you to work in progress.

Lab orientation at the implanter, experimental hall, and laser labs:

- get hands on training for vacuum pumps (turbo, scroll, roots, welch, rotary vane, cryo, etc.) and flange norms (KF and CF).
- see a real detector system, spectrometer and the necessary NIM electronics (like fast amplifiers, constant fraction and logic modules).

On the job training: learn how to operate

- COLTRIMS chamber (pumping down and venting, baking)
- supersonic gas jet (operating and diagnostics)

- detectors (power-on, pulse decoupling, monitoring, trouble shooting, pulse processing & adjustment of the electronics). Carry out the lab-training course “V24 Ionen-Impulsspektroskopie” at the IKF, lab 1.307 (contact person: Lothar Schmidt, schmidt@atom.uni-frankfurt.de).
- COBOLD: data acquisition and analysis program (file structure, change parameter files, view and project spectra, interpret crucial spectra like, CNT, hitpattern, timesum vs layer, fish, wiggle, TOF, PIPICO” etc., add new spectra and parameters)

Extra: Data analysis

- if time permits, learn how to presort list-mode data files and read them with ROOT.