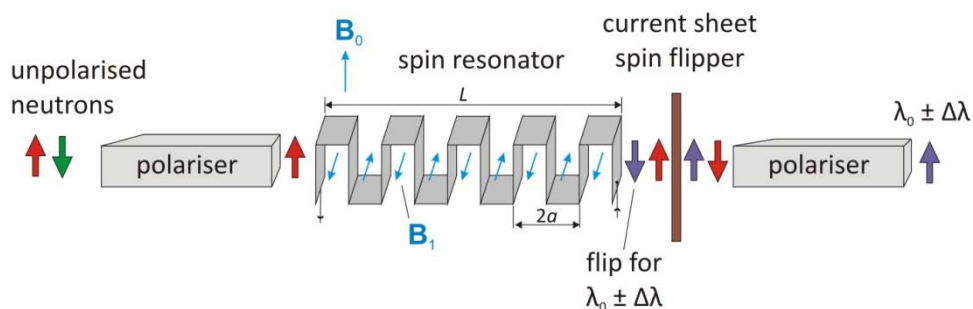


## Diploma Thesis / Master Thesis

# Design of a pulsed spatial neutron magnetic spin resonator

The PERC (Proton Electron Radiation Channel) project searches for new physics beyond the Standard Model of particle physics via the beta-decay of free neutrons. This high precision measurement demands perfect knowledge of the key beam parameters, i.e. wavelength distribution, degree of polarisation and time structure. Therefore, we plan a novel design of a spatial magnetic spin resonator, allowing precise velocity selection as well as the accurate definition of the beam's time structure by purely tuning electronic parameters [1].



We are looking for interested students who want to intensify their knowledge in the work with polarised neutrons, neutron magnetic spin resonance and high performance electronic circuits.

### Tasks:

- Prototype design and optimisation: magnetic field design, electronic control
- Characterisation and first measurements at the TRIGA reactor in Vienna
- Measurements at a "cold beam" at FRM II in Munich

**Contact: Group of Neutron and Quantum Physics, Atominstitut, TU Wien**

Prof. Dr. Hartmut Abele, [abele@ati.ac.at](mailto:abele@ati.ac.at)

Ass. Prof. Dr. Erwin Jericha, [jericha@ati.ac.at](mailto:jericha@ati.ac.at)

Christoph Gösselsberger, [goesselsberger@ati.ac.at](mailto:goesselsberger@ati.ac.at)

[1] Badurek, G., C. Gösselsberger, and E. Jericha, *Design of a pulsed spatial neutron magnetic spin resonator*. Physica B, [doi:10.1016/j.physb.2010.09.023](https://doi.org/10.1016/j.physb.2010.09.023).