

Bachelor/Master thesis

A cryogenic egress link based on WDM and SOH racetrack modulators

Many modern detector systems operate at **cryogenic temperatures** and require efficient readout of large numbers of sensors. To connect to readout electronics operating at room temperature, conventional RF lines impose limits on the scale of the systems due to heat load and bandwidth.

Optical cryogenic egress links provide an attractive alternative due to their low thermal load and high bandwidth. By using **Wavelength Division Multiplexing (WDM)**, multiple data channels can be transmitted over a single optical fiber, reducing the number of required connections. This thesis explores the concept of a cryogenic optical readout link based on WDM using highly-efficient **silicon-organic hybrid (SOH) racetrack modulators (RTM)**.

Your tasks:

- Developing functionalization processes for single SOH RTM
- Testing and evaluating performance of single SOH RTM at cryo
- Developing RF package for SOH RTM 4x optical engine
- Functionalization and packaging of SOH RTM 4x optical engine
- Transmission experiment of SOH RTM 4x optical engine at cryo

Interested? Please contact:

Adrian Schwarzenberger, M. Sc
adrian.schwarzenberger2@kit.edu
Tel. 0721 608-47170

Prof. Dr. Christian Koos
christian.koos@kit.edu
Tel. 0721-608-42786

