Student project/job opportunity

The Sea Ice Physics Section at the Alfred Wegener Institute obtains the key observations required to untangle the uncertainties of the rapid changes of Arctic and Antarctic sea ice. We are developing various sea ice thickness monitoring systems that can be used with helicopters, snowmobiles and ships or autonomously while placed on the ice for months. For different projects, we are looking for capable, independent students that are interested in developing the hardware and software components of such systems and their interfaces. The projects can be carried out as student job (HiWi) or BSc or MSc projects.

Autonomous sea ice monitoring system

The sea ice physics group uses different devices to measure the thickness of sea ice. Those devices are operated from aircrafts, helicopters, ships and snow mobiles along their track. To monitor the development of sea ice thickness at one location, an autonomous sea ice monitoring system will be developed. This platform is meant to collect data from different sensors (e.g. EM instrument, sonic rangefinder, GPS, laser distance meters) according to a set schedule. All sensors have to be switched off between the measurements to increase battery lifetime. The data is stored on external devices like SD-Cards that are exchanged every few month. This student project will be the first step of developing an autonomous sea ice monitoring system.

Tasks:

- Build a first data acquisition unit with appropriate and available hardware like Arduino, Raspberry Pi, etc.
- Modify the data acquisition unit to turn on and off external sensors
- Develop the firmware to receive data from different sensor over RS232, SPI or other common interfaces
- Store data on a exchangeable storage devices
- Perform long-term tests

Further development:

- Build a custom Circuit board that can withstand the extreme conditions of the Arctic and Antarctic
- Integrate the hardware in a rugged housing
- Add a LoRa Network interface to the data acquisition unit
- Update the firmware to transmit real-time data to a remote station

For further information, please contact: Or:

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