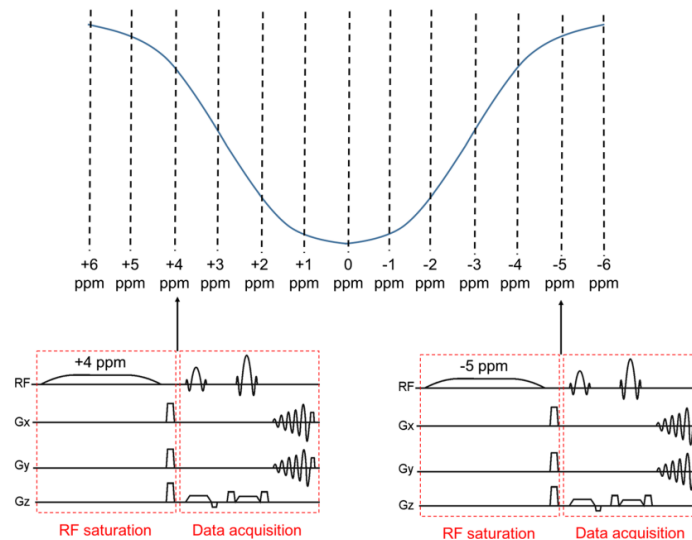**Bachelor Thesis:**

# Implementation of CEST Imaging Sequences using pulseq-cest



**Overview:**

CEST MRI (Chemical Exchange Saturation Transfer Magnetic Resonance Imaging) is a powerful imaging technique that allows the detection of metabolites in tissues by exploiting their chemical exchange properties. In CEST MRI, a radiofrequency pulse is used to saturate the protons of a specific chemical group (e.g., amide or hydroxyl) in the metabolites of interest. This saturation then transfers to the water protons in the surrounding tissue via chemical exchange, resulting in a reduction in the signal intensity of the water protons in the MRI image. This allows for the detection and quantification of metabolites that are otherwise difficult to image using traditional methods.

To improve imaging protocols in our CEST project, in this bachelor thesis multiple CEST readout strategies should be implemented and compared to the currently used CEST readout. Examples for different readout strategies are available from pulseq.

**Specific tasks:**

- Research about different CEST Readouts
- Implementation of chosen CEST Readouts in pulseq-cest (Matlab or Python)
- Phantom and (maybe) in vivo MRI measurements
- Comparison of readout methods

**Recommended Knowledge:**

- Programming basics (and willingness to improve)
- Interest in sequence programming
- Basic git workflow

**Contact:**

Markus Huemer
huemer@tugraz.at