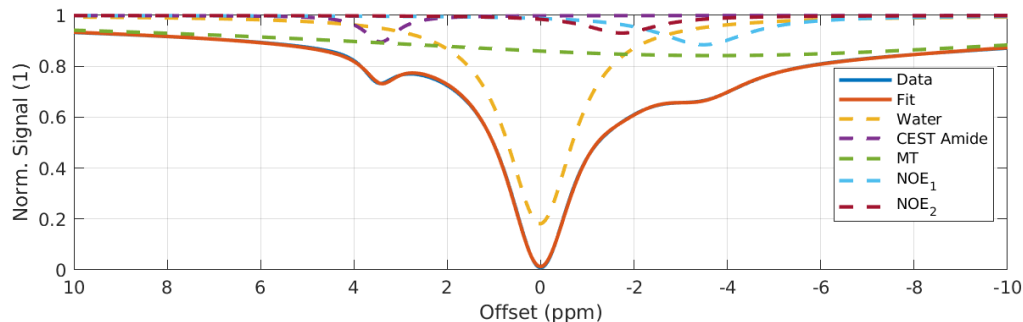


Bachelor Thesis:

Implementation of Multipool Lorentzian CEST fitting in BART



Overview:

The **Chemical Exchange Saturation Transfer (CEST)** contrast allows the detection of specific molecular information, by using the exchange between solute pools and free water to amplify the signal. A common analysis technique of the resulting Z-Spectrum is **Multipool Lorentzian fitting**, where multiple Lorentzian functions are fitted to the spectrum to quantify individual contributions. Recently an approach using joint spatial total generalized variation regularization (TGVj) was proposed to improve the SNR and the stability of nonlinear parameter mapping.

The aim of this thesis is to translate Multipool-Lorentzian fitting with TGVj from the existing Python/openCL implementation to the BART framework, an open source MR image reconstruction toolbox.

Specific tasks:

- Understanding the existing fitting model and algorithm
- Implementing the algorithm and model in BART (C programming language)
- Evaluating the different implementations for results and speed
- Documenting the results

Recommended Knowledge:

- Programming basics (and willingness to improve)
- Interest in MR and optimization
- Basic git workflow

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