Layer-specific functional MRI (fMRI) studies aim to address questions on directional flow of information between brain areas located at different cortical depths. In recent years, the advances in ultra-high field MRI have enabled the study of layer-dependent activation in the human cortex non-invasively. However, several methodological challenges remain when it comes to data analysis. For example, studies using BOLD (Blood Oxygen Level Dependent) contrast are affected by a signal bias towards the superficial layers due to the presence of large draining veins but there is no consensus on how to correct for such effects. There are also several options for artefact correction, as well as different methods for segmentation of cortical layers, most of which do not take into account the correspondence between cortical depth and cytoarchitectonical cortical layers. The aim of this project is to explore the different options for data analysis in fMRI layer-dependent studies and develop optimised analysis pipelines which can be applied to 7T MRI data analysis with minimal manual input from the user.

References and URL(s)

**URL**
https://doi.org/10.1016/j.neuroimage.2021.118091