**Scripts for manuscript**

*Linking microstructural integrity and motor cortex excitability in multiple sclerosis*

*Radetz et al., 2021*

***BASH code***

**get\_sbjn**

This scripts creates subject IDs that are loaded by the main scripts

**DWI\_preproc.sh**

This script contains the preprocessing steps of diffusion-weighted images (FSL)

**recon.sh**

This script contains the preprocessing steps of T1-weighted images (FreeSurfer)

**dti2fs\_mask.sh**

This script transforms FA and NODDI maps, as well as the left M1 HMAT mask into the individual FreeSurfer space. The intersection of the left M1 mask with the cortical ribbon is computed.

**submit\_script\_py.sh**

This script calls the script written in python for computation of NODDI values with AMICO

**tbss.sh**

This scripts performs tract-based spatial statistics

**extract\_tbss\_masks\_smatt.sh**

This script overlays the results of tract-based spatial statistics with each S-MATT mask and computes the number of overlapping voxels

**left\_m1\_lesion\_fsspace.sh**

This script overlays the transformed lesion maps (into FreeSurfer space) with the left M1 mask to compute the number of voxels depicting lesioned tissue

**intersections\_fa\_noddi\_tbss\_smatt.sh**

This script creates binary masks of overlapping FA and NODDI voxels within each SMATT mask

For supplementary material

**intersections\_fa\_noddi\_tbss\_jhu.sh**

This script creates binary masks of overlapping FA and NODDI voxels within each JHU mask

**extract\_diffmetrics\_smatt\_m1\_fs.sh**

This script computes average FA and NODDI values within the left-M1 S-MATT mask

**handknob\_gm.sh1**

This script computes average FA and NODDI values within the handknob

***PYTHON code***

**noddiscript.py**

This script computes NODDI values using AMICO

***MATLAB code***

**tbss\_pie\_barplot.m**

This script creates Figures 6 and S5 (pie and barplot related to TBSS analysis)

**tbss\_table\_fa\_ndi\_odi.m**

This script creates Table 2 and S7 (number and percentage of voxels significantly differing between MS and HC in FA, NDI and ODI in SMATT and JHU regions)

**corrcoef\_fdr\_threshold\_np\_FA\_NODDI.m**

This script computes correlation coefficients between FA, NODDI values and motor threshold/neuropsychological scores

**load\_fa\_noddi\_vals.m**

This script loads the single files including average FA and NODDI values within left M1/handknob/left M1 SMATT obtained subsequently to FSL and FreeSurfer operations and saves them

**lesion\_segmentation.m**

This script performs lesion segmentation and estimation of lesion volume using the Lesion Segmentation Toolbox (LST) in SPM

**load\_lesion\_vals.m**

This script loads the single files created subsequently to SPM, FSL and FreeSurfer operations. These files contain the number and percentage of lesioned voxels within the left M1 mask

**create\_sphere\_handknob.m**

This script creates a sphere around the handknob area

**plot\_regress\_threshold\_npsych\_NDI.m**

This script creates Figures 3 and 4 (scatterplot, regression line and density estimates of the regressions of neurite density index on motor threshold in MS/HC and on TMT-A and TMT-B in MS)

**group\_comp\_fa\_noddi\_threshold**

This script computes group differences, averages and standard deviations of MS and HC thresholds and FA and NODDI values within left M1

***R code***

**R\_corrplot**

This script creates correlation plots (Figures 2, S1, S3 and S4)

***SPSS code***

**SPSS\_hierarchical\_regressions**

This script performs hierarchical regressions.