

Send tracts to MNI space

T1 > DWI space > T1 (DWI space) > MNI space -----

#Generate combined warps between space of DWI, T1 and MNI

```
$ epi_reg --pedir=-y --epi=b0.nii.gz --t1=T1.nii.gz --t1brain=T1_bet.nii.gz --out=dwi2T1
$ convert_xfm -omat T12dwi.mat -inverse dwi2T1.mat
$ flirt -in T1_bet.nii.gz -ref b0.nii.gz -out T12dwi.nii.gz -init T12dwi.mat -applyxfm
$ flirt -ref MNI152_T1_3mm_brain.nii.gz -in T12dwi.nii.gz -omat T12MNI_affine.mat
$ fnirt --ref=MNI152_T1_3mm_brain.nii.gz --in=T12dwi.nii.gz --aff=T12MNI_affine.mat --
cout=warps_T12MNI
$ invwarp --ref=T12dwi.nii.gz --warp=warps_T12MNI --out=warps_MNI2T1
```

Initialise warp

```
$ warpinit MNI152_T1_3mm_brain.nii.gz inv_identity_warp_no.nii
$ applywarp --ref=b0.nii.gz --in=inv_identity_warp_no.nii --warp=warps_MNI2T1.nii.gz --
out=mrtrix_warp_MNI2dwi.nii.gz
$ mrconvert inv_identity_warp_no.nii -coord 3 0 - | mrcalc - 0 -mult 1 -add
inv_identity_warp_mask.nii
```

Apply the transformation to identity warp

```
$ applywarp --ref=b0.nii.gz --in=inv_identity_warp_mask.nii --warp=warps_MNI2T1.nii.gz --
out=mrtrix_warp_MNI2dwi_mask.nii.gz
$ mrcalc mrtrix_warp_MNI2dwi_mask.nii.gz 1 nan -if mrtrix_warp_MNI2dwi.nii.gz -mult
mrtrix_warp_MNI2dwi_valid.nii.gz
$ mrtransform MNI152_T1_3mm_brain.nii.gz -warp mrtrix_warp_MNI2dwi_valid.nii.gz
MNI2dwi.nii.gz # Check the transformation
```

Tracts (DWI space) > MNI space -----

```
$ tcktransform SIFT.tck mrtrix_warp_MNI2dwi_valid.nii.gz SIFT_MNI.tck -force
$ tcktransform FACT.tck mrtrix_warp_MNI2dwi_valid.nii.gz FACT_MNI.tck
$ tcktransform MTCSD_1M.tck mrtrix_warp_MNI2dwi_valid.nii.gz MTCSD_MNI.tck
```

FOD (DWI space) > MNI space -----

Initialise warp

```
$ warpinit b0.nii.gz inv_identity_warp_no_2.nii
$ applywarp --ref=MNI152_T1_3mm_brain.nii.gz --in=inv_identity_warp_no_2.nii --
warp=warps_T12MNI.nii.gz --out=mrtrix_warp_dwi2MNI.nii.gz
$ mrconvert inv_identity_warp_no_2.nii -coord 3 0 - | mrcalc - 0 -mult 1 -add
inv_identity_warp_mask_2.nii
```

Apply the transformation to identity warp

```
$ applywarp --ref=MNI152_T1_3mm_brain.nii.gz --in=inv_identity_warp_mask_2.nii --
warp=warps_T12MNI.nii.gz --out=mrtrix_warp_dwi2MNI_mask.nii.gz
$ mrcalc mrtrix_warp_dwi2MNI_mask.nii.gz 1 nan -if mrtrix_warp_dwi2MNI.nii.gz -mult
mrtrix_warp_dwi2MNI_valid.nii.gz
$ mrtransform b0.nii.gz -warp mrtrix_warp_dwi2MNI_valid.nii.gz dwi2MNI.nii.gz # Check the
transformation
```