

# Multi-Spatial Resolution MRI Guided PET Image Reconstruction with Adaptive Prior Strength

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MRI-guided PET reconstruction has shown to reduce noise, and increase spatial resolution and quantification accuracy in PET imaging. However, its application has mainly been limited to brain imaging due to the availability of high resolution isotropic 3D MRI sequences, which are rarely used in whole-body MRI. The present work employs multi-parametric PET-MRI reconstruction to combine more than one MRI sequence with different spatial resolutions in different directions applied to non-brain MRI-guided PET reconstruction, in order to achieve high 3D PET spatial resolution. Results show that using MRI-guided PET reconstruction overall improves image quality in terms of noise and spatial resolution compared to OSEM, but the use of MRI sequences with anisotropic spatial resolution may cause the loss of detail. The combination of multiple sequences with different anisotropic voxel sizes in the PET reconstruction, prevents any loss of information while obtaining improved image quality compared to OSEM.

## Field

Software and quantification

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