

Performance Evaluation of a Fast Tomographic Reconstruction Software for PET

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This study presents a performance assessment of the Fast Tomographic Reconstruction (FTR) software for SAFIR PET insert with a non-cylindrical geometry. For this purpose, an image quality phantom and a Derenzo phantom were measured in the SAFIR-I and SAFIR-II scanners. The PET data were reconstructed by FTR and the well-known Software for Tomographic Image Reconstruction (STIR) and then evaluated based on NEMA NU4-2008 standards. According to the results, FTR produced high-quality images, preserving the finest details, while reducing the reconstruction time by factors of 0.22 (SAFIR-I) and 2.74 (SAFIR-II) compared to STIR. The evaluation of uniformity, recovery coefficients (RCs), and spill-over ratios (SORs) suggested comparable results with improved values in most cases for FTR relative to STIR at all iterations up to 10. NEMA characteristics didn't vary significantly after 6 iterations for both software. The results demonstrate the high performance of FTR in reconstructing SAFIR's images in terms of image quality and reconstruction time. In conclusion, FTR can accelerate the accurate image reconstruction for SAFIR scanners, particularly for SAFIR-II.

Field

Software and quantification

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