

Screen 01 - Investigation of the Impact of MR Hardware Attenuation on TOF and non-TOF PET/MR Images

Monday, 30 May 2022 16:15 (1h 15m)

The combination of positron emission tomography (PET) and magnetic resonance imaging (MR) allows the simultaneous scanning of a patient's anatomy as well as physiology. This setup comes with difficulties, as the coil hardware (HW) that is used for MR-acquisition attenuates the photons which are acquired by PET. Disregarding this attenuation can lead to an underestimation of accumulated activity in the patient.

This study investigates the influence of different attenuating hardware and phantoms using simulation. An activity cylinder was attenuated by headphones (either foam or PVC) or a multichannel MR-coil using the CT image of the latter. Phantom attenuation was changed between water and air to investigate its influence in iterative reconstruction methods. Additionally, the attenuating effect of PVC-headphones on brainweb data was investigated. As earlier studies have shown that TOF emission data contains substantial information about the attenuation, simulations were performed utilising both TOF and non-TOF data.

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Session Classification: Poster session

Track Classification: PET/MR and SPECT/MR systems and applications