

Direct SSS Application through Accurate System Model

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In PET image reconstruction, scatter correction is conducted for more quantitatively correct imaging. One of scatter correction methods is Single Scatter Simulation (SSS) method. This method has benefit of case specific scatter correction so that it can be suitable for asymmetric source distribution which can be problematic with other methods for scatter correction. Usually, this method is to calculate scatter contribution estimation through simulation then fits and scales to experimental sinograms for practical scatter fraction calculation.

In this study, accurate modelling of system matrix and SSS are conducted to estimate scatter fraction on each channel directly case-specifically. Details will be discussed in the presentation.

Geant4 simulation was conducted. The simulated object has dimension of 60 mm diameter 24 mm height cylinder filled with water. The simulated radioisotope is F-18 and it has the same dimension with the water. Figure 1 shows the difference between scatter uncorrected image and scatter corrected with suggested method. Uncorrected image shows larger intensity in the center compared to corrected image.

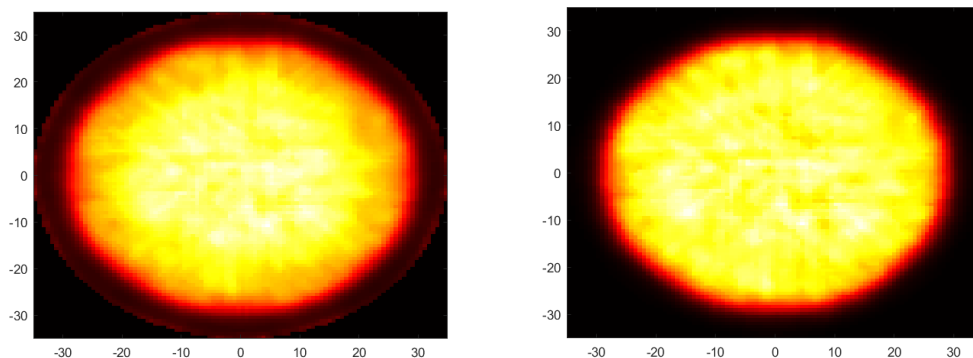


Figure 1 Result of scatter correction. Left: scatter uncorrected. Right: scatter corrected with suggested method.