

Harmonization of PET Image Reconstruction Parameters on Multiple PET/MRI Systems

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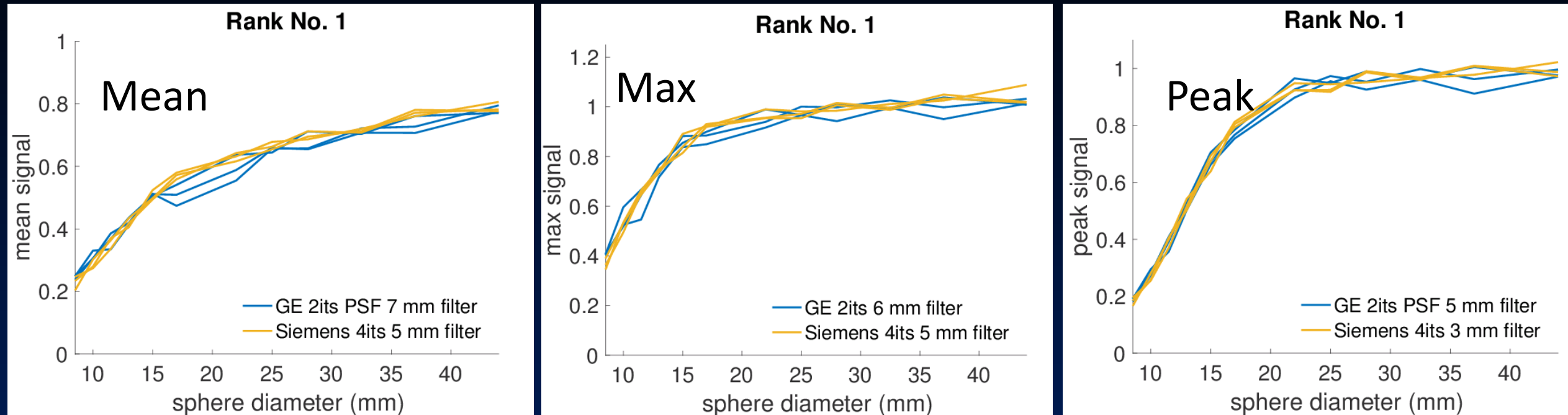
Aim: Harmonization of PET in PET/MRI for Cancer Clinical Trials

Presentation Number: 291
Monday June 25th 13:20

Methodology:

- Standard filling protocol: NEMA IEC phantom with 10:1 sphere:background
 - 1) standard sphere set: 10, 13, 17, 22, 28 and 38 mm diameter
 - 2) custom sphere set: 8.5, 11, 15, 25, 32.5 and 44 mm diameter
- Experiment repeated three times at two sites (UCSF and WU)
- Image reconstruction method
 - Siemens mMR: 3D-OSEM +/- PSF, 21 subsets, 1 to 4 iterations, 3-7 mm filter
 - GE SIGNA: 3D-OSEM+TOF +/- PSF, 16 subsets, 2 and 4 iterations, 3-7 mm filter
- Contrast of Recovery Coefficients calculated for mean, max and peak.
- Best match across vendors determined by least square minimization of CRC curves over 800 image reconstruction combinations

Best Match Contrast Recovery Coefficients



- Range of image reconstruction parameters results in wildly different quantitative performance across the two manufacturers,
- Significant overlap of CRC curves between the two manufacturers was observed and Harmonization is possible.
- Best match was determined