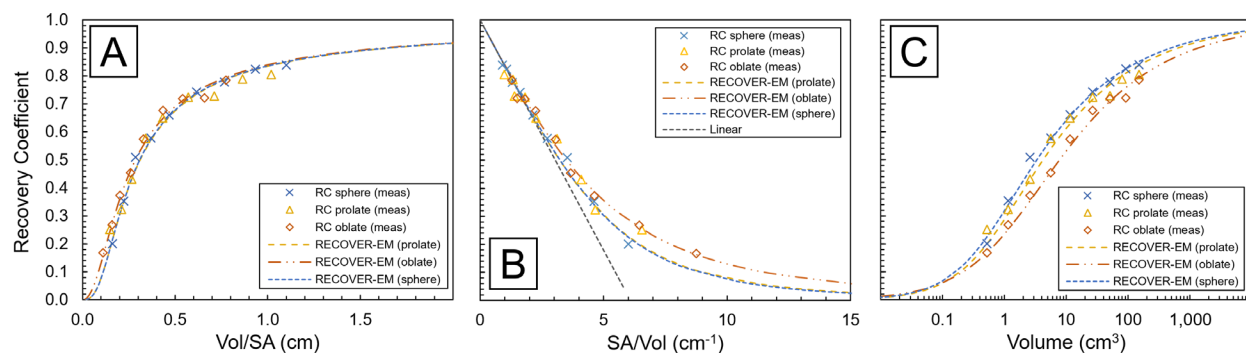


Supplemental Figure 1: A) National Electrical Manufacturers Association (NEMA) International Electrotechnical Commission (IEC) phantom digital reference object (DRO), and B) DRO convolved with a 3D Gaussian filter (18 mm full width at half maximum (FWHM)).



Supplemental Figure 2: ^{99m}Tc RC-curves generated with the RECOVER-EM model (Eq. 9) and the RC data for the various inserts. A) V/SA versus RC, B) SA/V versus RC, C) V versus RC. The markers represent measured data ("meas" is short for "measured").

Supplemental Table 1: Mean absolute difference (MAD) and minimum and maximum differences, for the RECOVER-EM and RECOVER-GM models compared to simulations. A spherical assumption is included for reference. RCs between 0.05-0.90 were included in the analysis. Sphericity is denoted by ψ .

		RECOVER-EM			RECOVER-GM			Spherical Assumption (Eq. 4)		
Shape (a,b,c)	ψ	MAD	Max diff	Min Abs diff	MAD	Max diff	Min diff	MAD	Max diff	Min diff
Prolate (1,1,2)	0.93	0.0016	-0.0001	-0.0051	0.0019	0.0029	-0.0019	0.0162	0.0275	0.0038
Prolate (1,1,4)	0.79	0.0027	0.0012	-0.0084	0.0054	0.0103	-0.0024	0.0599	0.0971	0.0113
Prolate (1,1,8)	0.64	0.0042	0.0075	-0.0065	0.0086	0.0177	-0.0014	0.1191	0.1848	0.0336
Prolate (1,1,6)	0.51	0.0061	0.0135	-0.0034	0.0116	0.0221	-0.0007	0.1729	0.2737	0.0483
Oblate (2,2,1)	0.91	0.0009	0.0000	-0.0025	0.0024	0.0037	-0.0025	0.0187	0.0315	0.0032
Oblate (4,4,1)	0.70	0.0020	0.0015	-0.0079	0.0083	0.0148	-0.0037	0.0762	0.1215	0.0122
Oblate (8,8,1)	0.48	0.0050	0.0097	-0.0123	0.0082	0.0273	-0.0031	0.1121	0.2440	0.0001
Oblate (16,16,1)	0.31	0.0088	0.0204	-0.0143	0.0173	0.0372	-0.0021	0.2157	0.3681	0.0613

Supplemental Table 2: Simulated IEC phantom with sphere-to-background ratio (SBR) 8.8:1 and an 18 mm FWHM Gaussian filter applied. Resolution estimates obtained using the Resolution Equivalent Recovery Coefficient (RERC) equation (Eq. 12), the European Association of Nuclear Medicine EANM (2-parameter logistic (PL) function) equivalent, and a matched-filter analysis (MFA). RC_{meas} is the measured recovery coefficient.

Sphere diameter ϕ (mm)	RC_{meas}	RC_{out}	2-PL model FWHM (mm)	3-PL model FWHM (mm)	Ground Truth FWHM (mm)
10	0.17	0.06	27.2	17.9	18.0
13	0.21	0.11	23.7	18.1	18.0
17	0.28	0.19	20.5	18.1	18.0
22	0.38	0.30	18.4	18.0	18.0
28	0.48	0.41	17.4	18.0	18.0
37	0.59	0.53	17.0	18.0	18.0
Average RERC resolution:			20.7	18.0	
Matched-Filter Analysis:				18.0	