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Modeling subdiffusive light scattering by incorporating the tissue phase function and detector numerical aperture (Erratum)

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This article [*J. Biomed. Opt.* 22(5), 050501 (2017), doi: 10.1117/1.JBO.22.5.050501] was originally published online on 22 May 2017, with an error in a subset of the phase functions used in the simulations. Instead of double Henyey Greenstein (HG) phase functions [Eqs. (1)–(2), where $\mu = \cos(\theta)$ and θ is the scattering angle],

$$p(\mu) = \alpha HG(g_f) + (1-\alpha)HG(g_b) \tag{1}$$

$$HG(g) = \frac{1-g^2}{(1+g^2-2g\mu)^{3/2}}, \tag{2}$$

another type of phase function was used [Eqs. (3)–(4)]:

$$p(\mu) = \alpha PF(g_f) + (1-\alpha)PF(g_b) \tag{3}$$

$$PF(g) = \frac{1-g^2}{2(1+g^2-2g\mu)^3}. \tag{4}$$

The obtained phase functions, Eqs. (1) and (3), were normalized so that the integral of the phase functions over μ from -1 to 1 was equal to 1. The authors redid their analysis after removing the subset of simulations that had used the incorrectly labeled double HG phase functions [Eqs. (3)–(4)] and adding simulations with the correct double HG phase functions [Eqs. (1)–(2)]. Based on the parameters in Table 1 and Eqs. (1)–(2), this resulted in 144 simulations with double HG phase functions (rather than 177, as originally reported on p. 050501-2).

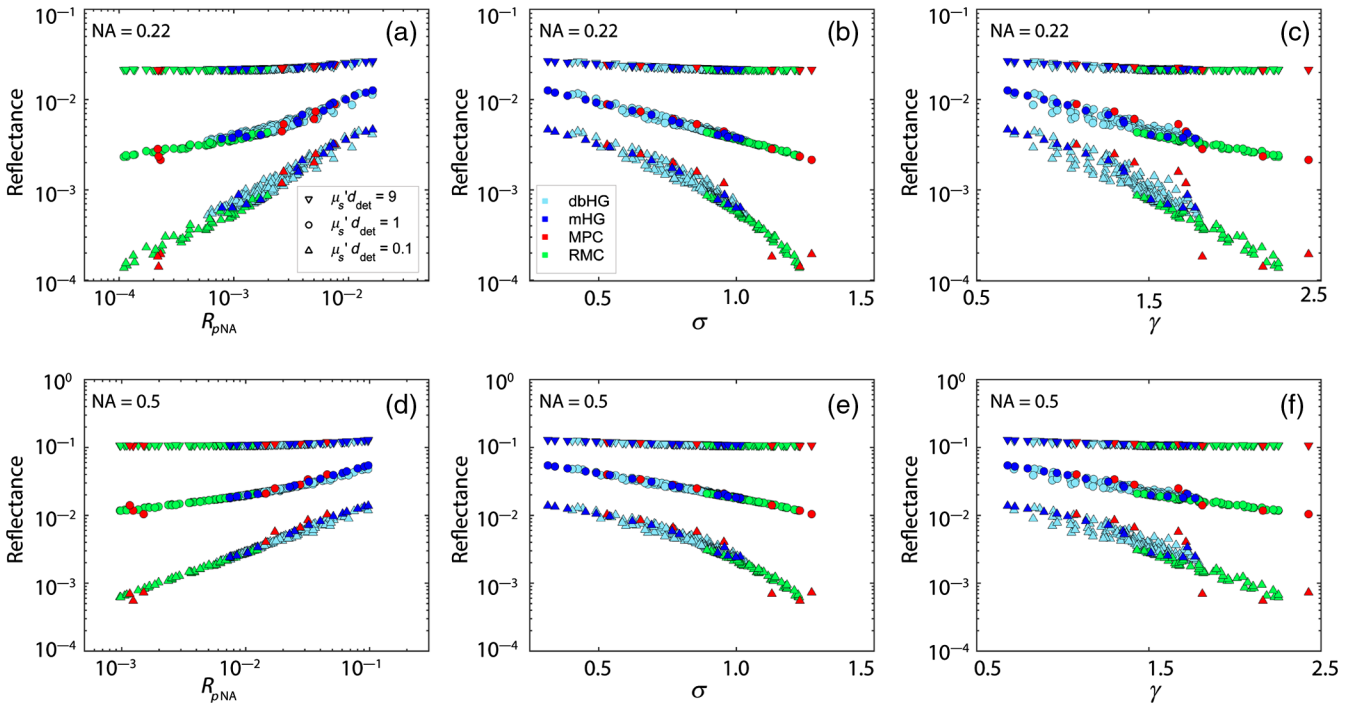

Fig. 2 Simulated reflectance versus R_{pNA}, σ, and γ for (a)–(c) NA = 0.22 and (d)–(f) NA = 0.5. Symbols indicate $\mu_s' d_{det}$ values, and colors indicate phase function types. Note the log scales for both the reflectance and R_{pNA}.

Table 2 Variability of R_{pNA}, σ and γ for $\mu_s' d_{\text{det}} = 0.1$ and $\mu_s' d_{\text{det}} = 1$, defined as the spread in R_{pNA}, σ and γ values for a chosen reflectance (±10%) relative to the total range of each parameter.

			Variability		
$\mu_s' d_{\text{det}}$	NA	Reflectance	R_{pNA}	σ	γ
0.1	0.22	0.0005	0.01	0.04	0.08
		0.001	0.05	0.08	0.13
		0.003	0.24	0.16	0.20
	0.5	0.001	0.01	0.05	0.11
		0.003	0.04	0.10	0.17
		0.005	0.08	0.13	0.20
1	0.22	0.003	0.04	0.11	0.16
		0.004	0.07	0.13	0.20
		0.006	0.15	0.18	0.23
	0.5	0.015	0.04	0.09	0.15
		0.020	0.08	0.14	0.20
		0.030	0.24	0.19	0.27

Table 2 and Fig. 2 based on the simulations with the correct double HG phase functions (and the simulations with mHG, MPC and RMC phase functions from the original paper) are shown here. For $\mu_s' d_{\text{det}} = 1$, the lowest reflectance values increased and, therefore, the variability (Table 2) was calculated for the new (higher) minimum reflectance value.

Based on these new simulations, the authors note that, although the values of the variability of R_{pNA}, σ and γ have changed, the overall conclusion that R_{pNA} improves prediction of the reflectance holds, nonetheless.

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