# Optical Engineering 

# Errata: Reanalysis of turbulence effects on short-exposure passive imaging 

David H. Tofsted

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David H. Tofsted<br>U.S. Army Research Laboratory, Computational and Information Sciences Directorate, Attn: RDRL-CIE-D, White Sands Missile Range, New Mexico 88002-5501

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This article [Opt. Eng. 50(1), 016001 (2011)] was originally published on 6 January 2011 with errors in Eqs. (51) to (57). They are corrected below.

The approximation written in Eq. (51) should have included an $\omega^{2}$ dependence inside the exponential:
$M_{T}(Q, X, \omega) \approx \exp \left\{+(2.1 X)^{5 / 3} N(Q, X) \omega^{2}\right\}$.

The expression for $A$ in Eq. (54) should have been written using the limits

$$
A= \begin{cases}0.840+0.116 \Sigma\left(q_{a}\right), & q_{a}=1.35(q+1.50) ; q>-1.50  \tag{54}\\ 0.840+0.280 \Sigma\left(q_{c}\right), & q_{c}=0.51(q+1.50) ; q \leq-1.50\end{cases}
$$

The negative sign in Eq. (56) should have been inside the exponent:

$$
\begin{align*}
M_{S}(\omega) & =M_{0}(\omega) M_{S A}(Q, X, \omega) \\
& =M_{0}(\omega) \exp \left\{-(2.1 X \omega)^{5 / 3}\left[1-V(Q, X) \omega^{1 / 3}\right]\right\} \tag{56}
\end{align*}
$$

A factor of $2 \pi$ was missing from Eq. (57):
$R_{X}=2 \pi \Omega_{0}^{2} \int_{0}^{1} \omega M_{X}(\omega) d \omega$.
The use of $V(Q, X)$ was based on the approximation of Eq. (51) where the primary $\omega$ dependence was quadratic. The function was evaluated at the -3 dB point of the $M_{S}(\omega)$ curve that yielded $V>1$ under certain conditions. This was incorrectly interpreted as super-resolution behavior. Further research indicates the approximation expression improves performance at low to moderate frequencies but overestimates responses at high frequencies at moderate turbulence levels. In general $V$ is a moderate function of $\omega, V(Q, X, \omega)$, that falls below unity at high frequencies $\omega$ in such a way that diffraction limits are maintained. Enhanced responses $(V>1)$ often appear for $Q>1$ and $\omega \approx 1 / 3$.

