Erratum to "A Modulation Format Correction Formula for the Gaussian Noise Model in the Presence of Inter-Channel Stimulated Raman Scattering"

Daniel Semrau, *Student Member, IEEE,* Eric Sillekens, *Student Member, IEEE,* Robert I. Killey, *Senior Member, IEEE,* and Polina Bayvel, *Fellow, IEEE, Fellow, OSA*

Abstract—This document corrects a misprint in the printed version of this paper, published in vol 37, issue 19, pp. 5122–5131, Oct. 2019.

The results, figures and conclusion are unchanged, and the error only appears in the print version of the manuscript.

I. Corrections

A misprint has been identified in the variable $\phi_{i,k}$ following Eq. (16) on page 5128. The correct definition of $\phi_{i,k}$ is different in Eq. (14) and in Eq. (15)(16). This is done to be consistent with prior work [1, Appendix A].

Corrections are marked in boldface; the affected equations are:

Eq. (14), as in [2, Eq. (14)],

$$\mu\left(f_1 + f_i, f_k, f_i\right) \approx -\frac{1 + \tilde{T}_k}{-\alpha + j\phi_{i,k}f_1} + \frac{\tilde{T}_k}{-A + j\phi_{i,k}f_1}, \quad (1)$$

with $\phi_{i,k} = \mathbf{-4}\pi^2 \left(f_k - f_i\right)\left[\beta_2 + \pi\beta_3(f_i + f_k)\right]$.

Eq. (15), as in [2, Eq. (15)],

$$\eta_{\text{corr.},n}\left(f_i\right) \approx \frac{80}{81}\Phi \sum_{k=1,k\neq i}^{N_{\text{ch}}} \left(\frac{P_k}{P_i}\right)^2 \frac{\gamma^2}{B_k}\left\{\frac{1}{\phi_{i,k}\bar{\alpha}\left(2\alpha + \bar{\alpha}\right)}\right.$$
$$\cdot\left[\frac{T_k - \alpha^2}{\alpha}\text{atan}\left(\frac{\phi_{i,k}B_i}{\alpha}\right) + \frac{A^2 - T_k}{A}\ \text{atan}\left(\frac{\phi_{i,k}B_i}{A}\right)\right]$$
$$\left.+\frac{2\pi\tilde{n}T_k}{|\phi|B_k^2\alpha^2 A^2}\left[\left(2\left|\Delta f\right| - B_k\right)\log\left(\frac{2\left|\Delta f\right| - B_k}{2\left|\Delta f\right| + B_k}\right) + 2B_k\right]\right\}, \quad (2)$$

with $\phi_{i,k} = \mathbf{-2}\pi^2 \left(f_k - f_i\right)\left[\beta_2 + \pi\beta_3(f_i + f_k)\right]$.

Eq. (16), as in [2, Eq. (16)],

$$\eta_n\left(f_i\right) \approx \frac{4}{9}\frac{\gamma^2}{B_i^2}\frac{\pi n^{1+\epsilon}}{\phi_i\bar{\alpha}\left(2\alpha + \bar{\alpha}\right)}$$
$$\cdot\left[\frac{T_i - \alpha^2}{\alpha}\text{asinh}\left(\frac{\phi_i B_i^2}{\pi a}\right) + \frac{A^2 - T_i}{A}\text{asinh}\left(\frac{\phi_i B_i^2}{\pi A}\right)\right]$$
$$+\frac{32}{27}\sum_{k=1,k\neq i}^{N_{\text{ch}}}\left(\frac{P_k}{P_i}\right)^2 \frac{\gamma^2}{B_k}\left\{\frac{n + \frac{5}{6}\Phi}{\phi_{i,k}\bar{\alpha}\left(2\alpha + \bar{\alpha}\right)}\right.$$
$$\cdot\left[\frac{T_k - \alpha^2}{\alpha}\text{atan}\left(\frac{\phi_{i,k}B_i}{\alpha}\right) + \frac{A^2 - T_k}{A}\ \text{atan}\left(\frac{\phi_{i,k}B_i}{A}\right)\right]$$
$$\left.+\frac{5}{3}\frac{\Phi\pi\tilde{n}T_k}{|\phi|B_k^2\alpha^2 A^2}\left[\left(2\left|\Delta f\right| - B_k\right)\log\left(\frac{2\left|\Delta f\right| - B_k}{2\left|\Delta f\right| + B_k}\right) + 2B_k\right]\right\}, \quad (3)$$

with $\phi_{i,k} = \mathbf{-2}\pi^2 \left(f_k - f_i\right)\left[\beta_2 + \pi\beta_3(f_i + f_k)\right]$.

References

[1] D. Semrau, R. I. Killey, and P. Bayvel, "A closed-form approximation of the Gaussian noise model in the presence of inter-channel stimulated Raman scattering," *J. Lightw. Technol.*, pp. 1–1, Jan. 2019.

[2] D. Semrau, E. Sillekens, R. I. Killey, and P. Bayvel, "A modulation format correction formula for the Gaussian noise model in the presence of inter-channel stimulated Raman scattering," *J. Lightw. Technol.*, vol. 37, no. 19, pp. 5122–5131, Oct 2019.