Erratum
Vol. 27, No. 3 | 4 Feb 2019 | OPTICS EXPRESS 3617
Optics EXPRESS

Polarization-multiplexed nonlinear inverse synthesis with standard and reduced-complexity NFT processing: erratum

STELLA CIVELLI,[1,2,*] SERGEI K. TURITSYN,[2] MARCO SECONDINI,[1] AND JAROSLAW E. PRILEPSKY,[2]

[1] *TeCIP Institute, Scuola Superiore Sant'Anna, Pisa, Italy*
[2] *Aston Institute of Photonic Technologies, Aston University, Birmingham, UK*
[*] *stella.civelli@santannapisa.it*

Abstract: We correct a formula for the numerical nonlinear Fourier transform in [1]. The conclusions of our work are unchanged.

In Section 3.1 of [1] the single-step transfer matrix $U^{(n)}$, Eq. (20) and its derivative Eq. (25) are not correct. The transfer matrix—obtained via eigenvalue decomposition—should be

$$U^{(n)}_{m,\ell} = \begin{cases} c_0 - j\lambda s_0 & m = \ell = 1, \\ q^{(n)}_{\ell-1} s_0 & m = 1 \text{ and } \ell \geq 2, \\ -\sigma q^{(n)*}_{m-1} s_0 & m \geq 2 \text{ and } \ell = 1, \\ r_{m-1,\ell-1}\left[c_0 + j\lambda s_0 - e^{j\lambda\delta}\right] & m = 2 \text{ and } \ell \geq 3 \text{ or } \ell = 2 \text{ and } m \geq 3, \\ r_{m-1,\ell-1}\left[c_0 + j\lambda s_0\right] + e^{j\lambda\delta}(1 - r_{m-1,m-1}) & m = \ell = 2 \text{ or } m, \ell \geq 3, \end{cases} \tag{1}$$

where $r_{m\ell} = q^{(n)*}_m q^{(n)}_\ell / \sum_{k=1}^{M} |q^{(n)}_k|^2$. The derivative $U'^{(n)}$ follows from (1). Equation (20) in [1], though not exact, is a first order approximation of (1). The use of Eq. (20) in [1] rather than (1) yields different performance at higher powers and oversampling factors, see Figs. 1(a) and 1(b) for $M = 2$. However, since the oversampling factor in [1] is $N_D = N_I = 4$, both matrices can be used without any variation. We verified that the performance metrics showed in [1] in Figs. 3(a) and 3(b) are unaffected when the new matrix (1) is used for the signal processing.

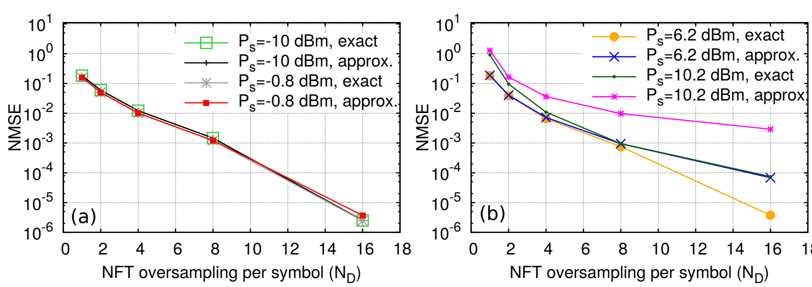

Fig. 1. NMSE—Eq. (37) of [1]—versus oversampling factor N_D, with $N_I = 16$ and $N_s = 8$.

References

1. S. Civelli, S. Turitsyn, M. Secondini, and J. Prilepsky, "Polarization-multiplexed nonlinear inverse synthesis with standard and reduced-complexity NFT processing," Opt. Express **26**, 17360–17377 (2018).

#357142
Journal © 2019
https://doi.org/10.1364/OE.27.003617
Received 10 Jan 2019; published 31 Jan 2019