

# Erratum: High-NA aberration retrieval with the Extended Nijboer-Zernike vector diffraction theory

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In the paper "*High-NA aberration retrieval with the Extended Nijboer-Zernike vector diffraction theory*" by S. van Haver, J.J.M. Braat, P. Dirksen and A.J.E.M. Janssen, published in *J. Europ. Opt. Soc. Rap. Public.* **1**, 06004 (2006), some regrettable notation errors are present in Eq.(10), page 06004-3. The expression gives the azimuthal Fourier components  $\Psi_{an}^m(r, f)$  of the analytically calculated intensity distribution in the focal region of a high-numerical-aperture focused beam as a function of the radial and axial coordinates,  $r$  and  $f$ , respectively. On line 4 of Eq.(10) in this publication, the upper index of the coefficient  $\beta$  was erroneously given as  $m$  but should have been  $-m$ . On line 10 of the same equation, the lower indices of  $\Psi_{\nu;0,2}^{(m+2)*}$  should be changed into  $\Psi_{\nu;2,0}^{(m+2)*}$ ; on line 14, the lower indices of  $\Psi_{\nu;0,2}^{(-m+2)}$  should become  $\Psi_{\nu;2,0}^{(-m+2)}$ . The correct version of Eq.(10) for  $\Psi_{an}^m(r, f)$  is reproduced in full below,

$$\Psi_{an}^m(r, f) = \frac{\beta_0^0}{2} \sum_{\nu} \left\{ \begin{aligned} &\beta_{\nu}^{m*} (2 - \epsilon_{\nu,m}) \left[ \Psi_{\nu;0,0}^{m*} + s_0^2 \left\{ (\Psi_{\nu;1,1}^{m*} + \Psi_{\nu;-1,-1}^{m*}) + \frac{s_0^2}{2} (\Psi_{\nu;2,2}^{m*} + \Psi_{\nu;-2,-2}^{m*}) \right. \right. \\ &\quad \left. \left. - 2\text{Im}(ab^*) \left[ (\Psi_{\nu;1,1}^{m*} - \Psi_{\nu;-1,-1}^{m*}) + \frac{s_0^2}{2} (\Psi_{\nu;2,2}^{m*} - \Psi_{\nu;-2,-2}^{m*}) \right] \right\} \right] \\ &+ \beta_{\nu}^{-m} (2 - \epsilon_{\nu,m}) \left[ \Psi_{\nu;0,0}^{-m} + s_0^2 \left\{ (\Psi_{\nu;1,1}^{-m} + \Psi_{\nu;-1,-1}^{-m}) + \frac{s_0^2}{2} (\Psi_{\nu;2,2}^{-m} + \Psi_{\nu;-2,-2}^{-m}) \right. \right. \\ &\quad \left. \left. - 2\text{Im}(ab^*) \left[ (\Psi_{\nu;1,1}^{-m} - \Psi_{\nu;-1,-1}^{-m}) + \frac{s_0^2}{2} (\Psi_{\nu;2,2}^{-m} - \Psi_{\nu;-2,-2}^{-m}) \right] \right\} \right] \end{aligned} \right\}$$

$$\begin{aligned}
& +\beta_{\nu}^{(m-2)*} \left[ \left\{ |a|^2 - |b|^2 \right\} + 2i\text{Re}(ab^*) \right] \times \\
& \quad s_0^2 \left\{ \Psi_{\nu;0,2}^{(m-2)*} + (1 - \epsilon_{\nu,m-2}) \left[ \Psi_{\nu;-2,0}^{(m-2)*} - 2\Psi_{\nu;-1,+1}^{(m-2)*} \right] \right\} \\
& +\beta_{\nu}^{(m+2)*} \left[ \left\{ |a|^2 - |b|^2 \right\} - 2i\text{Re}(ab^*) \right] \times \\
& \quad s_0^2 \left\{ (1 - \epsilon_{\nu,m+2}) \Psi_{\nu;2,0}^{(m+2)*} + \Psi_{\nu;0,-2}^{(m+2)*} - 2\Psi_{\nu;+1,-1}^{(m+2)*} \right\} \\
& +\beta_{\nu}^{(-m-2)} \left[ \left\{ |a|^2 - |b|^2 \right\} - 2i\text{Re}(ab^*) \right] \times \\
& \quad s_0^2 \left\{ \Psi_{\nu;0,2}^{(-m-2)} + (1 - \epsilon_{\nu,m+2}) \left[ \Psi_{\nu;-2,0}^{(-m-2)} - 2\Psi_{\nu;-1,+1}^{(-m-2)} \right] \right\} \\
& +\beta_{\nu}^{(-m+2)} \left[ \left\{ |a|^2 - |b|^2 \right\} + 2i\text{Re}(ab^*) \right] \times \\
& \quad \left. s_0^2 \left\{ (1 - \epsilon_{\nu,m-2}) \Psi_{\nu;2,0}^{(-m+2)} + \Psi_{\nu;0,-2}^{(-m+2)} - 2\Psi_{\nu;+1,-1}^{(-m+2)} \right\} \right\} .
\end{aligned}$$

The numerical results described in the paper were not affected by the notational errors in Eq.(10) as it was shown in Fig. 5 of the paper by the perfect convergence to their original values of the retrieved  $\beta$ -coefficients, down to machine precision. The errors in question were not present in the computational program that was used for the retrieval of the coefficients.