Erratum

Erratum to “Bragg Reflection and Conversion Between Helical Bloch Modes in Chiral Three-Core Photonic Crystal Fiber”

Sébastien Loranger, Yang Chen, Paul Roth, Michael H. Frosz, Gordon K. L. Wong, and Philip St. J. Russell

***Abstract*—The dispersion relation for the helical Bloch modes in this paper contains an error, which affects Equation (3) in the original manuscript, as well as Fig. 2. Otherwise the conclusions of the paper are unaffected.**

I. Erratum

SUBSEQUENT analysis has revealed that the dispersion relation in (3) in this paper [1] is incorrect, because it does not take proper account of the transformation from the helicoidal to the cartesian frame. The correct analysis has been reported in detail in a recent paper [2]. As a result (3) should be replaced with:

$$\beta(\ell_{\mathrm{A}i}^{(0)}) = \beta_i = \beta_0\sqrt{1+\alpha^2\rho^2} - \alpha\ell_{\mathrm{T}i}^{(0)} - s_i\alpha^3\rho^2/2 + 2\kappa\sqrt{1+\alpha^2\rho^2}\cos\left(2\pi(\ell_{\mathrm{T}i}^{(0)} + \beta_0\alpha\rho^2)/N\right)$$

where $\ell_{\mathrm{T}i}^{(0)} = \ell_{\mathrm{A}i}^{(0)} - s_i$ is the topological charge (named orbital angular momentum in the original paper). The term containing α^3 yields a very small circular birefringence, which can be neglected. The revised version of Fig. 2 is shown below.

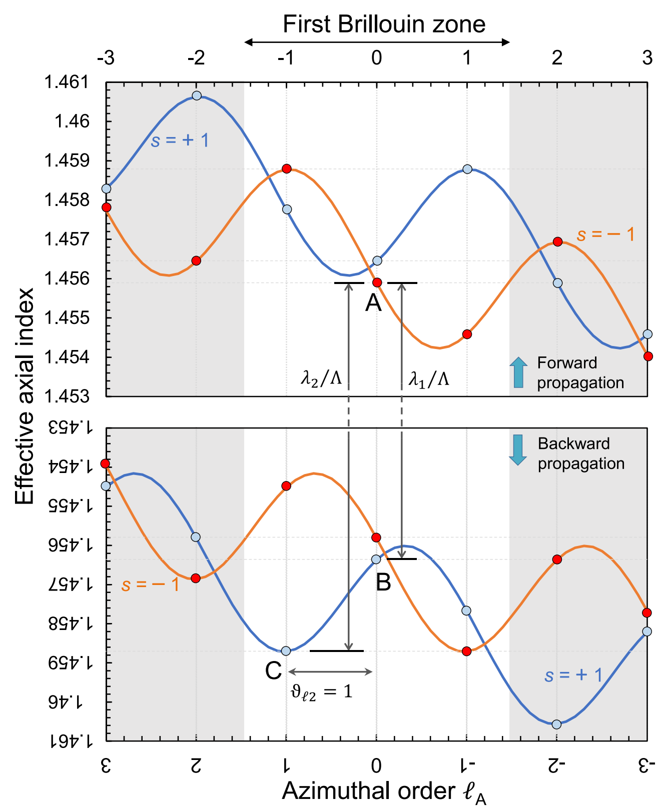

Fig. 2. Dispersion diagram of the modes in the system in the forward and backward direction from (3). The backward direction is a 180° rotation of the forward diagram (note the reversed axes). Two Bragg reflections are shown. At λ_1 conversion is between forward and backward modes with zero azimuthal order and opposite spins (scattering from A to B). At λ_2 conversion is between an $\ell_{\mathrm{A}} = 0$ forward mode and an $\ell_{\mathrm{A}} = +1$ backward mode, i.e., $\vartheta_\ell = +1$ (scattering from A to C). The sum of the backward and forward refractive indices adds up to λ_i/Λ in each case, where Λ is the grating pitch.

References

[1] S. Loranger, Y. Chen, P. Roth, M. Frosz, G. K. L. Wong, and P. S. J. Russell, “Bragg reflection and conversion between helical Bloch modes in chiral three-core photonic crystal fiber,” *J. Lightw. Technol.*, vol. 38, no. 15, pp. 4100–4107, Aug. 2020.

[2] Y. Chen and P. St. J. Russell, “Frenet–Serret analysis of helical Bloch modes in N-fold rotationally symmetric rings of coupled spiraling optical waveguides,” *J. Opt. Soc. Amer. B*, vol. 38, no. 4, pp. 1173–1183, 2021.

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