

Erratum: High-performance chiral mirrors by twisted anisotropic photonic crystals [Phys. Rev. Applied **23**, 064027 (2025)]

Andrea Alessandrini, Leone di Mauro Villari, Luca Assogna, Matteo Silvestri, Matteo Venturi, Carino Ferrante, Paola Benassi, Davide Tedeschi, and Andrea Marini 



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It has come to our attention that, while preparing the manuscript, we overlooked relevant literature from both historical [1–4] and application-related perspectives [5,6]. Indeed, in 1869, Eduard Reusch proposed the so-called Reusch pile [1–4], a periodic multilayer comprising multiple layers of the same homogeneous, uniaxial dielectric material, such that the extraordinary axis in each layer is rotated about the propagation direction with respect to the extraordinary axis in the previous layer. This is indeed the same underlying principle as that of the device proposed in our manuscript. Reusch did not evaluate reflection and transmission amplitudes, as it required the solution of a complex boundary-value problem (BVP). The most straightforward technique to solve this BVP lies in the adoption of the transfer matrix approach, which was actually later adopted to model the functionality of Reusch piles in several works by Lakhtakia *et al.*; see, e.g., Refs. [5,6]. A Reusch pile preferentially reflects light of one circular polarization while preserving its helicity in multiple spectral regimes [7]. This phenomenon is called circular Bragg reflection [8] and depends on both the number of layers per period of the pile and the dispersion properties of the medium itself [9]. Therefore, the Reusch pile has paved the way for a branch of research focused on the study of (either naturally or artificially) twisted devices that offer a different response based on right-handed or left-handed polarization light excitations. Examples include cholesteric liquid crystals [10–13], which naturally self-assemble into helical structures whose pitch matches visible wavelengths. Moreover, the Šolc filters are also conceptually related to Reusch piles [14–17], as well as the so-called chiral sculptured thin films [18–21].

To conclude, the purpose of this Erratum is to provide the proper historical context by briefly reviewing important literature that was inadvertently overlooked. Our theoretical analysis thus extends previous results by providing a fully analytical expression for the electromagnetic field within every anisotropic medium (oriented as the layers in a Reusch pile) and for the electromagnetic torque exerted by the device on the propagating optical field. Furthermore, the Reusch pile realization in the form of the particular twisted anisotropic photonic crystals illustrated in our manuscript further extends previous relevant results in the field. Nevertheless, the key results and conclusions of the paper are not affected in any way.

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- [1] E. Reusch, Untersuchung über Glimmercombinationen, *Ann. Phys. (Berlin)* **138**, 628 (1869).
- [2] F. Reinitzer, Beiträge zur kenntniss des cholesterins, Monatshefte für Chemie und verwandte Teile anderer, *Wissenschaften* **9**, 421 (1888).
- [3] G. Joly and J. Billard, Quelques champs électromagnétiques dans les piles de Reusch. II. Piles éclairées sous l’incidence normale par des ondes monochromatiques planes et uniformes, *J. Opt.* **13**, 227 (1982).
- [4] G. Joly and N. Isaert, Quelques champs électromagnétiques dans les piles de Reusch. IV: Domaines multiples de réflexion sélective, *J. Opt.* **17**, 211 (1986).
- [5] T. G. Mackay and A. Lakhtakia, *The Transfer-Matrix Method in Electromagnetics and Optics* (Springer Nature, Cham, Switzerland, 2022).
- [6] E. Reusch and A. Lakhtakia, Optical investigations on periodic multilayers of mica, in *More Adventures in Contemporary Electromagnetic Theory*, edited by F. Chiadini and V. Fiumara (Springer, Cham, Switzerland, 2025), pp. 1–16.
- [7] M. Dixit and A. Lakhtakia, Electrically controlled Bragg resonances of an ambichiral electro-optic structure: Oblique incidence, *Asian J. Phys.* **17**, 213 (2008).
- [8] M. Faryad and A. Lakhtakia, The circular Bragg phenomenon, *Adv. Opt. Photonics* **6**, 225 (2014).

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- [9] I. J. Hodgkinson, A. Lakhtakia, Q. hong Wu, L. De Silva, and M. W. McCall, Ambichiral, equichiral and finely chiral layered structures, *Opt. Commun.* **239**, 353 (2004).
- [10] R. Nityananda, On the theory of light propagation in cholesteric liquid crystals, *Mol. Cryst. Liq. Cryst.* **21**, 315 (1973).
- [11] S. Garoff, R. B. Meyer, and R. Barakat, Kinematic and dynamic light scattering from the periodic structure of a chiral smectic C liquid crystal, *J. Opt. Soc. Am.* **68**, 1217 (1978).
- [12] C. Oldano, P. Allia, and L. Trossi, Optical properties of anisotropic periodic helical structures, *J. Phys.* **46**, 573 (1985).
- [13] I. Abdulhalim, L. Benguigui, and R. Weil, Selective reflection by helicoidal liquid crystals. Results of an exact calculation using the 4×4 characteristic matrix method, *J. Phys.* **46**, 815 (1985).
- [14] I. Šolc, A new kind of double refracting filter, *Czech. J. Phys.* **4**, 65 (1954).
- [15] A. Lakhtakia, Dielectric sculptured thin films as Šolc filters, *Opt. Eng.* **37**, 1870 (1998).
- [16] E. Ertekin and A. Lakhtakia, Sculptured thin film Šolc filters for optical sensing of gas concentration, *Eur. Phys. J. Appl. Phys.* **5**, 45 (1999).
- [17] L. Dettwiller, Polarizing Šolc filters: A pedagogical derivation in the complex plane, *C. R. Phys.* **22**, 89 (2021).
- [18] N. O. Young and J. Kowal, Optically active fluorite films, *Nature (London)* **183**, 104 (1959).
- [19] A. Lakhtakia and R. Messier, *Sculptured Thin Films: Nanoengineered Morphology and Optics* (SPIE Press, Bellingham, Washington, USA, 2005).
- [20] S. Erten, A. Lakhtakia, and G. D. Barber, Experimental investigation of circular Bragg phenomenon for oblique incidence, *J. Opt. Soc. Am. A* **32**, 764 (2015).
- [21] P. D. McAtee and A. Lakhtakia, Experimental and theoretical investigation of the co-occurrence of linear and circular dichroisms for oblique incidence of light on chiral sculptured thin films, *J. Opt. Soc. Am. A* **35**, 1131 (2018).