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Reflection and transmission coefficients of a cholesteric liquid crystal film with a negative dielectric coefficient[1] SABRINA RELAIX, WENYI CAO, PETER PALFFY-MUHORAY, Liquid Crystal Institute, Kent State University — A cholesteric liquid crystal (CLC) is a periodic dielectric structure where simple analytic solutions of Maxwell's equations exist: light propagating along the helical axis has been first described by Mauguin in 1911 [1], for wavelengths much smaller than the helical pitch, and was formulated more generally by de Vries in 1951 [2]. The analytical solutions are for bulk CLCs and do not describe the optical properties of a finite thickness CLC film. Recently, analytic expressions for the reflection and transmission coefficients of a CLC slab have been obtained by solving Maxwell's equations and satisfying boundary conditions [3,4], providing results for thick slabs which go beyond the limitation of numerical methods. We discuss how these results are modified when one of the dielectric coefficients is negative. We explore the connection with hyperbolic dispersion and negative index materials. [1] C. Mauguin, Bull. Soc. Fr. Miner. Cristallogr. 34, 6 (1911) [2] H. de Vries, Acta Crystallogr. 4, 219 (1951) [3] W. Cao, Ph.D. dissertation, Chemical Physics, Kent State University (2005) (http://e-LC.org) [4] S. Relaix, W. Cao and P. Palffy-Muhoray, to be published

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