

Abstract Submitted
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Bloch-dipole-Zener Oscillations in Binary Parabolic Optical Waveguide Arrays¹ MING JIE ZHENG², YUN SAN CHAN, KIN WAH YU, The Chinese University of Hong Kong — We have studied the propagation and Zener tunneling of light in the binary parabolic optical waveguide arrays (BPOWA) consisting of two evanescently coupled dissimilar optical waveguides. BPOWA attains two minibands with a gap at the zone edge due to Bragg reflections. Various superposition of optical oscillations and Zener tunneling are identified for different parameters on the phase diagram. In particular, both Bloch-Zener oscillation [1] and Bloch-dipole-Zener oscillation are obtained in the BPOWA by the field-evolution analysis. The research results may have potential applications in optical splitting and waveguiding devices and shed light on the coherent phenomena in lattice structures [2].

[1] F. Dreisow, A. Szameit, M. Heinrich, T. Pertsch, S. Nolte, A. Tunnermann, and S. Longhi, “Bloch-Zener Oscillations in Binary Superlattices,” *Phys. Rev. Lett.* 102, 076802 (2009).

[2] M. J. Zheng, G. Wang, and K. W. Yu, “Tunable Hybridization at Mid Zone and Anomalous Bloch-Zener Oscillations in Optical Waveguide Ladders,” *Opt. Lett.* (in press).

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