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Gate-controllable magneto-optic Kerr effect in layered collinear antiferromagnets[1] NIKHIL SIVADAS, School of Applied and Engineering Physics, Cornell University, Ithaca, New York 14853 USA, SATOSHI OKAMOTO, Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA, DI XIAO, Department of Physics, Carnegie Mellon University, Pittsburgh, Pennsylvania 15213, USA — Using symmetry arguments and a tight-binding model, we show that for layered collinear antiferromagnets, magneto-optic effects can be generated and manipulated by controlling crystal symmetries through a gate voltage. This provides a promising route for electric field manipulation of the magneto-optic effects without modifying the underlying magnetic structure. We further demonstrate the gate control of magneto-optic Kerr effect (MOKE) in bilayer $MnPSe_3$ using first-principles calculations. The field-induced inversion symmetry breaking effect leads to gate-controllable MOKE whose direction of rotation can be switched by the reversal of the gate voltage.

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