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Optical Switching Using Coherent Perfect Polarization Rotation in a One Dimensional Photonic Crystal¹ CHUANHONG ZHOU, JAMES ANDREWS, MICHAEL CRESCIMANNO, Youngstown State University — We report a high efficiency optical switch using coherent perfect polarization rotation effect (CPR) in a one dimensional photonic crystal (PC). The two-port device uses a counter-propagating control beam and is designed such that most light energy is located in the Faraday-active layers, significantly enhancing the polarization rotation and thus decreasing the size of the optical switch. CPR leads to high rotation efficiency in the optical switch due to the absence of reflected light. We show that more than 98% energy can be switched in direction and polarization by simply changing the phase of the control beam. This technique has promising applications in photonic circuits, computation, memory and photonic logic gates.

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