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Coherent Perfect Rotation: The conservative analogue of CPA MICHAEL CRESCIMANNO, NATHAN DAWSON, JAMES ANDREWS, Dept. Physics and Astro, Youngstown State Univ. — The two classes of conservative, linear, optical rotary effects (optical activity and Faraday rotation) are distinguished by their behavior under time reversal. In analogy with coherent perfect absorption (CPA) resonances, where counter-propagating light fields are completely converted into other degrees of freedom, we show that in a linear conservative medium only time-odd (Faraday) rotation is capable of coherent perfect rotation, by which we mean the complete transfer of *any* arbitrarily oriented polarization of light into the other orthogonal polarization via the application of phased counter-propagating light fields. This contributes to the understanding of the importance of time reversal symmetry in perfect mode conversion that may be of use in optical device design.

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