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Propagator Methods in Spintronics applied to the Rashba Hamiltonian BAILEY HSU, JEAN-FRANCOIS VAN HUELE, Brigham Young University — In spintronics, the spin of the electrons is manipulated to create spin currents. New propagators are introduced in order to determine the evolution of the spin systems. Rashba potentials are considered in connection with the spin-orbit couplings in condensed matter systems. We calculate the propagator for the Rashba Hamiltonian $H = \frac{P^2}{2m} + \frac{\alpha}{\hbar}(\sigma_x P_y - \sigma_y P_x)$ and comment on how to deal with noncommuting operators.

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