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Neutron Interference in the Gravitational Field of a Ring Laser
ROBERT FISCHETTI, Physics Department, University of Connecticut — A number of analyses of neutron interference effects due to various metric perturbations have been found in the literature [1,2]. However, the approach of each author depends on a specific metric. I will present a new general technique giving the Foldy-Wouthuysen transformed Hamiltonian for a Dirac particle in the most general linearized space-time metric. I will then apply this new technique to calculate the phase shift on a neutron beam interferometer due to the gravitational field of a ring laser [3].

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[2] F. W. Hehl and W. T. Ni, Phys. Rev. D, vol 42, no. 6, pp. 2045-2048, 1990.
[3] R. L. Mallett, Phys. Lett. A 269, 214 (2000).

Robert Fischetti
Physics Department, University of Connecticut

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