

Abstract Submitted
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Gravitational Polarization & The Schiff-Dessler Controversy

PAWEL MORAWICE¹, Univ of South Carolina, MING YIN, Benedict College, Sc 29204, MICHAEL WESCOTT, DAN OVERCASH, TIMIR DATTA, Univ of South Carolina — The behavior of composite matter in external fields can be very revealing. The quantum mechanical problem of an electrically conducting material object (test mass) placed in a uniform (weak) gravitational field, \mathbf{g} , was considered by many authors starting with Schiff [Phys. Rev. 151, 1067 (1966)]. Depending on the theoretical treatment opposing results of gravity induced (electric) field \mathbf{E}_g have been reported. In the Schiff model [L.I. Schiff, PRB, **1**, 4649 (1970)] \mathbf{E}_g is predicted to be oriented anti-parallel (with reference to \mathbf{g}). On the other hand it is found to be parallel in the more realistic elastic lattice model [A. J. Dessler et al, Phys.Rev, **168**, 737, (1968); Edward Teller, PNAS, **74**, 2664 (1977)]. Surprisingly, this contradiction has been largely overlooked by modern researchers. The preliminary results of an experimental study will be reported. Several interesting theoretical and technological implications will be suggested.

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