Gravitational Polarization & The Schiff-Dessler Controversy
PAWEL MORAWICE	extsuperscript{1}, 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 reveling. The quantum mechanical problem of an electrically conducting material object (test mass) placed in a uniform (weak) gravitational field, \( g \), 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 \( E_g \) have been reported. In the Schiff model [L.I. Schiff, PRB, 1, 4649 (1970)] \( E_g \) is predicted to be oriented anti-parallel (with reference to \( g \)). 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.

\textsuperscript{1}Student

Ming Yin  
Benedict College, SC 29204  

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