

Abstract Submitted
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Explanation of the Tao effect J.E. HIRSCH, Department of Physics, University of California, San Diego — R. Tao and coworkers discovered that in an applied electric field superconducting microparticles aggregate to form balls of macroscopic dimensions⁽¹⁾. The phenomenon appears to be as general as the Meissner effect. Within the conventional theory of superconductivity electrostatic fields do not penetrate into superconductors and the observed effect would not be expected. We propose an explanation of the effect based on an alternative description of the electrodynamics of superconductors recently proposed⁽²⁾, that results from the unconventional theory of ‘hole superconductivity’. In our theory a spontaneous electrostatic field exists inside superconductors and if the sample is not spherical also outside. Experiments to test the theory will be discussed. (1) R. Tao, X. Xu and E. Amr, *Physica C* 398, 78 (2003) and references therein. (2) J.E. Hirsch, *Phys.Rev. B* 69, 214515 (2004) and references therein.

jorge hirsch
department of physics, university of california san diego

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