

Abstract Submitted  
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**Charge expulsion and Spin Meissner effect in superconductors**

J.E. HIRSCH, University of California San Diego — I argue that the Meissner effect (expulsion of magnetic field from the interior of a metal going into the superconducting state) cannot be explained by the conventional BCS-London theory, hence that BCS-London theory is incorrect[1]. The theory of hole superconductivity explains the Meissner effect as arising from the expulsion of negative charge from the interior of the superconductor towards the surface, resulting in a non-homogeneous charge distribution, a macroscopic electric field in the interior, and a spin current near the surface (Spin Meissner effect). Electrodynamical equations describing this scenario will be discussed[2]. In the charge sector, these equations are related to electrodynamic equations originally proposed by the London brothers[3] but shortly thereafter discarded by them[4]. [1] J.E. Hirsch, *Physica Scripta* 80, 035702 (2009). [2] J.E. Hirsch, *Ann. Phys. (Berlin)* 17, 380 (2008). [3] F. London and H. London, *Proc. R. Soc. London A*149, 71 (1935). [4] H. London, *Proc. R. Soc. London A*155, 102 (1936).

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