

Abstract Submitted
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Search for New Superconductors: An Electro-Magnetic Phase Transition in an Iron Meteorite Inclusion at 117 K STEFAN GUÉNON, PIT, Nano Atomoptics, University of Tuebingen, Germany, JUAN GABRIEL RAMIREZ, Department of Physics, Universidad de los Andes, Bogota, Colombia, ALI C. BASARAN, Department of Physics, Gebze Technical University, Turkey, JAMIE WAMPLER, Department of Physics and Center for Advanced Nanoscience, University of California San Diego, MARK THIEMENS, Department of Chemistry and Biochemistry, University of California San Diego, IVAN K. SCHULLER, Department of Physics and Center for Advanced Nanoscience, University of California San Diego — We investigated a natural iron sulfide based materials (Troilite) inclusion with its associated minerals in the iron meteorite Tlacotepec. The search for superconductivity in these heterogeneous materials requires a technique capable of detecting minute amounts of a superconducting phase embedded in a non-superconducting matrix. We used Magnetic Field Modulated Microwave Spectroscopy (FMMS), a very sensitive, selective, and non-destructive technique, to search for superconductivity in heterogeneous systems. Here, we report the observation of an electro-magnetic phase transition at 117 K that causes a FMMS-response typical of a superconductor. A pronounced and reproducible peak together with isothermal magnetic field sweeps proves the appearance of an electromagnetic phase below 117 K. This is very similar to the characteristic response due to flux trapping in a granular superconductor with a short coherence length. This work was supported by the AFOSR under the grant number AFOSR-MURI FA9550-14-1-0202.

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