

Abstract Submitted
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Search for Superconductivity in Extraterrestrial Materials: An Electro-Magnetic Phase Transition with Spin-Glass Characteristics¹ S. GUÉNON, PIT-Nano Optics, University of Tuebingen, Department of Physics and Center for Advanced Nanoscience, University of California San Diego, J.G. RAMIREZ, ALI C. BASARAN, J. WAMPLER, Department of Physics and Center for Advanced Nanoscience, University of California San Diego, S. TAYLOR, Cold Regions Research and Engineering Laboratory, Dartmouth College New Hampshire, M. 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 have established a very sensitive, selective, and non-destructive microwave absorption technique to screen a wide range of different materials for superconductivity. This technique allows for the detection of minute amounts of superconducting material in a non-superconducting matrix and it is an ideal tool for searching for superconducting phases in materials found in nature. Here, we report on electro-magnetic phase transitions in extraterrestrial materials formed under very extreme conditions difficult to replicate in a laboratory. Of particular interest is a phase with a transition temperature of 110 K. The associated field scans are characteristic of a frustrated system. Frustrated systems were reported in magnetic systems (spin glasses) as well as in granular high T_c superconductors (frustrated Josephson Junction networks). We will discuss a procedure to discriminate between those two cases.

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