

Abstract Submitted  
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**Micro-Calorimeter for Heat Capacity Studies of Sub-Microgram Superconducting Crystals**<sup>1</sup> CARLOS CHAPARRO, U. WELP, L. FANG, W.K. KWOK, Argonne National Laboratory, Argonne, IL 60439, USA, M. ESKILDSEN, Department of Physics, University of Notre Dame, Notre Dame, IN 46556, USA — A steady-state ac-temperature micro-calorimeter for heat capacity measurement of sub-microgram superconducting samples is presented. It utilizes thermocouple thermometers nano-patterned onto 150 nm thick Si<sub>3</sub>N<sub>4</sub> membranes. Theoretical models, mathematical relations describing the operation of the calorimeter and calibration procedures are discussed. The system achieves a resolution of 10<sup>-4</sup>; and allows for measurements from 5 K to room temperature. The calorimeter can be continuously rotated in a split-coil magnet generating up to 8 T. To demonstrate the performance of our device we present measurements of the specific heat of single crystals of SmFeAsO<sub>0.85</sub>F<sub>0.15</sub> (120 μm wide and 10 μm thick, crystal w1) and of BaFe<sub>2</sub>(As<sub>1-x</sub>P<sub>x</sub>)<sub>2</sub> (150 μm wide and 30 μm thick).

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