

Abstract Submitted
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AC Magnetic Susceptibility Probe for Use in a Commercial SQUID Magnetometer¹ J.D. COHEN, D.M. PAJEROWSKI, M.W. MEISEL, Dept. Physics, Univ. Florida — An AC magnetic susceptibility probe, employing a typical set of mutual inductance coils, has been constructed for operation in a commercial SQUID magnetometer operating down to 1.7 K and up to 7 T. The primary (~ 1000 turns) and counterwound secondary (each ~ 1300 turns) coils were wound with 44 AWG Cu wire on a Kapton tube possessing an ID of 6.4 mm. The ensemble of coils is ~ 30 mm long and has an OD of 8.7 mm, thereby allowing clearance into the sample region of the SQUID magnetometer. One variation of the probe included optical fibers that passed down the center of the stainless steel support rod. The detection electronics involve a lock-in amplifier and the experiment is controlled by LabView software. Typical AC (1 Hz - 1 kHz) fields of $\sim 10 \mu\text{T}$ afford the study of the temperature, frequency, and dc-field bias dependencies of magnetically interesting samples such as the spin ice material $\text{Ho}_2\text{Ti}_2\text{O}_7$ [1] and nanoparticles of Prussian blue analogs [2].

[1] M. Orendáč et al., elsewhere in these proceedings.

[2] D. M. Pajerowski, F. A. Frye, D. R. Talham, and M. W. Meisel, *New J. Phys.* 9 (2007) 222.

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