

Abstract Submitted
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A portable ultrasensitive atomic magnetometer for biomagnetic measurements ROBERT WYLLIE, Department of Physics, University of Wisconsin-Madison, RONALD WAKAI, Department of Medical Physics, University of Wisconsin-Madison, THAD WALKER, Department of Physics, University of Wisconsin-Madison — We present a portable Rb cell atomic magnetometer suited for biomagnetic measurements. Working in the spin-exchange relaxation free regime, we demonstrate an initial white noise floor of $10 \text{ fT}/(\text{Hz})^{1/2}$ above a $1/f$ noise bandwidth of 1 Hz. We show an adult magnetic cardiogram and demonstrate the feasibility of extending our measurements to fetal MCG. Based on previous experiments, we expect to be able to suppress nonmagnetic noise peaks by parametrically modulating the z-magnetic field, which also allows for the simultaneous measurement of the x and y field components using a single probe beam [1]. This work is supported by the NIH.

[1] Z Li, R T Wakai, and T G Walker, Appl. Phys. Lett. 89, 134105 (2006)

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