

Abstract Submitted
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A multichannel portable SERF atomic magnetometer for biomagnetic measurement¹ ROBERT WYLLIE, MATTHEW KAUER, GREGORY SMETANA, RONALD WAKAI, THAD WALKER, University of Wisconsin — We present a portable four-channel atomic magnetometer array operating in the spin exchange relaxation-free regime. Each channel was operated with a baseline sensitivity of 5–10 fT/ $\sqrt{\text{Hz}}$, at or near the expected Johnson noise limit of the mu-metal shielding. The magnetometer array has several design features intended to maximize its suitability for fetal magnetocardiography, such as a compact modular design, fiber coupled lasers, and magnetometer channel spacing adjustable from 5–10cm. We present adult magnetocardiogram using this array in a magnetically shielded room. We also show the acquisition and analysis of phantom fetal signals with a peak QRS amplitude of $\sim 1\text{pt}$, using an advanced nonlinear denoising algorithm.

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