Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Atomic Magnetometry for fetal Magnetocardiography IBRAHIM A. SULAI, THAD G. WALKER, RONALD T. WAKAI, University of Wisconsin - Madison — We present results of using an array of atomic magnetometers in detecting fetal Magnetocardiograms(fMCG) . The array consists of four 87-Rb atomic magnetometers operating in the spin exchange relaxation free (SERF) regime. They have a demonstrated sensitivity of 5 - 10 $fT/\sqrt{Hz}$–limited by the Johnson noise of the magnetic shielding. We report measurements of fMCG on gestational ages as small as 21 weeks and describe the technical challenges and design features that make the measurements possible. We present a method for minimizing the impact of AC Stark Shifts on the magnetometer array performance by relying on diffusion to transport polarized atoms from a pumping region to an AC Stark shift free active region. This work was supported by the NIH.

Ibrahim A. Sulai
University of Wisconsin - Madison

Date submitted: 25 Jan 2013 Electronic form version 1.4