Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Influence of noise on a magnetically sensitive atom interferometer[1] SARA A DESAVAGE, Naval Air Systems Command, ARVIND SRINIVASAN, St. Mary's College, JON P. DAVIS, Naval Air Systems Command, MATTHIAS ZIMMERMANN, MAXIM EFREMOV, Universität Ulm, ERNST RASEL, Universität Hannover, WOLFGANG SCHLEICH, Universität Ulm, GEORGE R. WELCH, Texas A&M University, JIHANE MIMIH, FRANK A. NARDUCCI, Naval Air Systems Command — The inherent sensitivity of atom interferometer sensors has been well established [1] and much progress has been made in the development of atom interferometer gravimeters, gravity gradiometers and gyroscopes e.g. [2]. These interferometers use the clock transition which is magnetically insensitive. When considering interferometers with magnetically sensitive transitions [3] operating in unshielded environments additional noise sources must be considered. The frequency content of the noise from these sources can vary dramatically, depending on the environment. In this talk, we will discuss these various noise sources and their impact on the performance of magnetically sensitive interferometers. Specifically, we identify three ways by which noise can be introduced into the system and their effect: fluctuating detuning, leading to a randomness of the interference pattern; fluctuating Rabi frequency, leading to pulse errors; non-uniformity of the magnetic field across the atom cloud, which can, under certain circumstances lead to a complete washing out of the interference pattern. Implications for our current experiments will be discussed. References [1] Phys. Rev. A, 48, 3186, (1993). [2] Phys. Rev. Lett., 114, 063002, (2015). [3] J. Mod. Opt., 55, 3173, (2008).

[1]Sponsored by the Office of Naval Research

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Date submitted: 29 Jan 2016 Electronic form version 1.4