

Abstract Submitted  
for the DAMOP09 Meeting of  
The American Physical Society

**Atomic Magnetometry in the Mesospheric Sodium Layer** B. PATTON, S. ROCHESTER, Department of Physics, UC Berkeley, J. HIGBIE, Department of Physics, Bucknell University, R. HOLZLÖHNER, D. BONACCINI CALIA, European Southern Observatory, D. BUDKER, Department of Physics, UC Berkeley and Nuclear Science Division, Lawrence Berkeley National Laboratory — Within the Earth’s mesosphere a band of free sodium atoms exists at altitudes of 90–100 km. This mesospheric sodium layer is the basis for “laser guide stars” employed in observational astronomy [1]. We will outline an experiment to use the  $^{23}\text{Na}$  atoms in this layer for high-precision atomic magnetometry; such a measurement would yield geomagnetic data on a previously unexplored length scale. A schematic of the proposed experiment will be presented, as well as some interesting challenges inherent in performing an atomic physics experiment outside the confines of the laboratory.

[1] W. Happer *et al.*, J. Opt Soc. Am. A **11**, 263 (1994)

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Date submitted: 26 Jan 2009

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