

Atomic-Optical Compass with pT Precision

E E MIKHAILOV¹, M GONZALEZ MALDONADO¹, I NOVIKOVA¹, J KITCHING², Y LI², I FAN², J MCKELVY³,
AND A MATSKO³

¹*Physics, William & Mary, Williamsburg VA, USA*

²*National Institute of Standards and Technology, Boulder CO, USA*

³*NASA Jet Propulsion Laboratory, Pasadena CA, USA*

Contact Email: eemikh@wm.edu

We present our effort toward a Rb based optical magnetometer operating at the Earth level magnetic field. Our magnetometer is able to reconstruct magnetic field direction and it is self referenced, *i.e.* the magnetic field direction is determined relative to the probe light propagation and a choice of the light polarization. The current sensitivity of our magnetometer is 1pT/rtHz at 50 μ T background.