

Abstract Submitted  
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**A High Sensitive Atomic Co-magnetometer for Rotation Rate Measurement Based on K-Rb-21Ne** YAO CHEN, Beihang University, SHENG ZOU, Southeast University, WEI QUAN, YAN LU, MING DING, JIANCHENG FANG, Beihang University — Atomic co-magnetometers use two spin ensembles occupying the same volume in glass vapor cells to suppress their sensitivity to magnetic field noise and leave them sensitive to rotation rate, anomalous fields, etc. Due to the small gyromagnetic ratio of the  $^{21}\text{Ne}$  atom, an atomic co-magnetometer based on  $^{21}\text{Ne}$  is very suitable for rotation rate measurement. Thus, we focus on and report a co-magnetometer for rotation rate measurement based on K-Rb- $^{21}\text{Ne}$ . We have developed a rotating co-magnetometer which is calibrated by the rotation of the earth. All the optics in the co-magnetometer have been encased in a bell jar in which the air is pumped away to suppress the air density fluctuation noise. MnZn ferrite is also utilized in the inner most magnetic field shielding system to suppress the magnetic field noise. We have reached rotation rate sensitivity of  $2.1 * 10^{-8}$  rad/ s / sqrt(Hz) or equivalent magnetic field noise level of 1.4 fT / sqrt(Hz) . The K-Rb- $^{21}\text{Ne}$  co-magnetometer has many potential applications for precision measurements, including spin dependent force detecting, Electric Dipole Moment measurement and fundamental symmetry test.

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