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Progress on a new pulsed ^{87}Rb - ^{21}Ne co-magnetometer JUNYI LEE, HUDSON LOUGHLIN, MORGAN HEDGES, MICHAEL ROMALIS, Princeton University — Atomic co-magnetometers are sensitive gyroscopes and have also been used in many precision measurements to look for new physics beyond the Standard Model. In particular an alkali metal-noble gas co-magnetometer has been successfully used to place stringent limits on Lorentz and CPT violating interactions, anomalous spin-mass and spin-spin interactions. However, the signal of such a co-magnetometer suffers from low frequency drifts of the CW optical pumping light used to polarize the atoms. We report here the development of a new pulsed ^{87}Rb - ^{21}Ne co-magnetometer that has the potential to overcome these limitations. In this scheme, ^{87}Rb is spin polarized by a short circularly polarized laser pulse and is then probed by off-resonant linearly polarized light. Fitting the decay signal to a model allows us to extract the signal of interest. We present simulation and experimental results of the pulsed co-magnetometer, calibrate the signal using Earth's rotation, and describe the low-frequency behavior of the system.

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