Abstract Submitted
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The K-Rb-3He co-magnetometer for the GNOME[1] MIKHAIL PADNIUK, SZYMON PUSTELNY, Jagiellonian University in Krakow, THE GLOBAL NETWORK OF OPTICAL MAGNETOMETERS FOR EXOTIC PHYSICS (GNOME) COLLABORATION — Atomic magnetometers are used to search for exotic physics. Yet, to limit the role of the magnetic field, such devices are typically operated as co-magnetometers. A specific example of the co-magnetomer is the system based on the mixture of a noble gas and alkali-metal vapor occupying the same glass cell. Coupled evolution of these spin samples at a specific magnetic field (so-called self-compensation mode) enables suppression of magnetic noise leaving nonmagnetic-coupling sensitivity unaffected. We describe the progress in construction of a K-Rb-3He magnetometer at the Jagiellonian University in Krakw. Due to operation in the spin-exchange relaxation free regime at the self-compensating mode, the comagnetometer is characterized with high sensitivity to nonmagnetic coupling. Careful investigation of the role of various experimental parameters will be presented. Future application of the comagnetometer in the Global Network of Optical Magnetometers for Exotic physics searches, searching for topological dark matter, will be also discussed. In the future, the comagnetometer will be used to search for domain walls of axion-like fields and axion planets or stars, which, within various models, are viable dark-matter candidates.

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