Abstract Submitted
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^{129}Xe two-photon spectroscopy towards the neutron EDM experiment at TRIUMF TOMOHIRO HAYAMIZU, EMILY ALTIERE, ERIC MILLER, JOSHUA WIENANDS, DAVID JONES, KIRK MADISON, TAKAMASA MOMOSE, The University of British Columbia — Neutron EDM experiments are highly sensitive to fluctuations and inhomogeneities of magnetic fields inside neutron trap chambers. Precise measurements of magnetic fields are essential to measure small EDM frequency shifts of neutrons. In order to suppress these effects, we will introduce a Xe-Hg dual co-magnetometer to operate in the measurement cell. ^{129}Xe was selected because it has a smaller neutron capture cross section than Hg, it is easy to control density, and it has two-photon excitation wavelengths close to Hg one-photon transition. We are planning to detect magnetic fluctuations by monitoring 823 nm and 895 nm emission intensity following a 252 nm two photon transition from $5p^6(^1S_0)$ to $5p^5(^2P_{3/2})6p$. We have observed this two photon transition and emission previously using a pulsed laser, and have recently constructed an intense 252 nm CW laser light source with the necessary hyperfine state resolution for the co-magnetometer operation. A UV enhancement cavity has been constructed to increase the excitation probability as well as to perform Doppler free spectroscopy of two-photon absorption. An avalanche photodiode (APD) is used to detect emission efficiently. We will report the present status of this measurement.

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