

Abstract Submitted  
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**Progress toward the measurement of nuclear-spin-dependent (NSD) parity non-conserving (PNC) transition in Cesium ground-hyperfine states.** JUNGU CHOI, GEORGE TOH, DAN ELLIOTT, Purdue Univ, COHERENT AND QUANTUM OPTICS LAB TEAM — We report our progress on the measurement of weak-force mixing of the ground hyperfine levels in atomic cesium. The effect of this mixing is manifested through weak amplitudes for transitions, which we will observe using an interference between optical and rf transitions. The cesium atomic beam interacts with rf fields confined in an open cavity via Stark-induced and Parity Non-conserving (PNC) transitions, as well as with optical fields via a strong Raman interaction. We have built the rf cavity resonator from copper-clad substrates and highly-reflecting cylindrical mirrors for the cesium ground hyperfine transition at 9.2 GHz. We performed characterization of the cavity mode that shows good field patterns and a reasonable quality factor of the mode for a few percent uncertainty experiment. We have made other preparations, including improving on phase-locked Raman lasers, to observe interference between optical and rf transitions from which the nuclear anapole moment will be derived. We present preliminary measurement results with focus on how to reduce systematic errors and other challenges we are facing.

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