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The hyperfine Stark effect of the $6d\,^2D_{3/2}$ and $7d\,^2D_{3/2}$ states of cesium measured using two-photon laser spectroscopy in a thermal beam[1]

ANDREW KORTYNA, JENNIFER GRAB, Department of Physics, Lafayette College, Easton, PA USA — The hyperfine Stark effect of $6d\,^2D_{3/2}$ and $7d\,^2D_{3/2}$ states of ^{133}Cs are studied using resonantly-enhanced laser spectroscopy. Two single-mode external-cavity diode lasers counter-propagate through a well collimated thermal beam of cesium. This interaction region is centered between two parallel field plates. The nd states are resonantly excited through the $6p\,^2P_{1/2}$ intermediate state and are detected with either laser-induced-fluorescence or photo-ionization by a pulsed laser. The relative frequency scale is calibrated in real-time by phase modulating the $6p\,^2P_{1/2} \rightarrow nd$ laser at precise frequencies. The absolute frequency is referenced to the two-photon transition measured in a field-free absorption cell of cesium vapor. The Stark shift of the hyperfine states and their magnetic sublevels are fitted to perturbation theory to find the scalar and tensor polarizabilities.

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