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Abstract:

### Direct Laser Absorption Spectroscopy Measurements of Transition Strengths in Cesium

We have measured directly via laser absorption spectroscopy the  $6s^2S_{1/2} \rightarrow 7p^2P_{3/2}$  to the  $6s^2S_{1/2} \rightarrow 7p^2P_{1/2}$  transition strength ratio in atomic cesium along with the individual electric dipole matrix elements for both of those transitions. The laser absorption spectrometer constructed for this experiment is described. Our motivation for constructing this apparatus is to perform high precision measurements of transition strengths and ratios important to the interpretation of parity nonconservation measurements and for testing electronic structure calculations in atomic cesium. We find a value for this ratio of 4.4605 (230), for the  $6s^2S_{1/2} \rightarrow 7p^2P_{3/2}$  transition of 0.5759(30) a.u., and for the  $6s^2S_{1/2} \rightarrow 7p^2P_{1/2}$  transition of 0.2743(29) a.u., all of which are consistent with previously performed measurements.