

HIGH-RESOLUTION PHOTOABSORPTION SPECTRUM OF Cs+
($5p^6\ ^1S_0 + 5p^5\ ns, nd$) BETWEEN 504Å AND 600Å
USING A LASER IONIZED Cs VAPOR COLUMN

T.J. McIlrath,^a V. Kaufman, J. Sugar,
W.T. Hill, III,^a and D. Cooper
National Bureau of Standards
Gaithersburg, MD 20899

Rapid ionization of Cs vapor in a heat pipe at 0.05 torr was achieved by pumping the $6s\ ^2S_{1/2} - 7p\ ^2P_{1/2}$ transition ($f=0.007$)¹ with a flash-pumped dye laser at 4563.2Å and 1 MW power output. Photoabsorption initiated at the end of the laser pulse ($\approx 0.5/\mu s$) showed the $5p\ ns$ and nd series below and above the $5p^5\ ^2P_{3/2}$ threshold at 535.4Å. Broad Beutler - Fano resonances appeared in the d series above threshold. The spectrum was recorded photographically on a 10.7m grazing incidence spectrograph using a continuum background generated by a BRV high-voltage spark source with a uranium anode. We will compare the line-shapes and the quantum defect (Lu-Fano)² plot with the predictions of a relativistic random phase calculation.

^aPermanent Address: Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742. P.M. Stone, Phys. Rev. 127, 1151 (1962).

²W.T. Hill, K.T. Chang, W.R. Johnson, T.B. Lucatorto, T.J. McIlrath, and J. Sugar, Phys. Rev. Lett. 49, 1631 (1982).