Abstract Submitted
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Atomic Transition Probabilities for Neutral Cerium J.E. LAWLER, E.A. DEN HARTOG, M.P. WOOD, Univ. of Wisconsin, D.E. NITZ, St. Olaf College, J. CHISHOLM, Boston College, J. SOBECK, Univ. of Chicago — The spectra of neutral cerium (Ce I) and singly ionized cerium (Ce II) are more complex than spectra of other rare earth species. The resulting high density of lines in the visible makes Ce ideal for use in metal halide (MH) High Intensity Discharge (HID) lamps. Inclusion of cerium-iodide in a lamp dose can improve both the Color Rendering Index and luminous efficacy of a MH-HID lamp. Basic spectroscopic data including absolute atomic transition probabilities for Ce I and Ce II are needed for diagnosing and modeling these MH-HID lamps. Recent work on Ce II [1] is now being augmented with similar work on Ce I. Radiative lifetimes from laser induced fluorescence measurements [2] on neutral Ce are being combined with emission branching fractions from spectra recorded using a Fourier transform spectrometer. A total of 14 high resolution spectra are being analyzed to determine branching fractions for 2000 to 3000 lines from 153 upper levels in neutral Ce. Representative data samples and progress to date will be presented.

[1] J. E. Lawler, C. Sneden, J. J. Cowan, I. I. Ivans, and E. A. Den Hartog, Astrophys. J. Suppl. Ser. 182, 51-79 (2009).
[2] E. A. Den Hartog, K. P. Buettner, and J. E. Lawler, J. Phys. B: Atomic, Molecular & Optical Physics 42, 085006 (7pp) (2009).

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