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Generation of Transition Probability Data: Can quantity and quality be balanced? J.J. CURRY, C. FROESE FISHER, NIST, Gaithersburg, USA — The possibility of truly predictive plasma modeling rests on the availability of large quantities of accurate atomic and molecular data. These include a variety of collision cross-sections and radiative transition data. An example of current interest concerns radiative transition probabilities for neutral Ce, an additive in highly-efficient metal-halide lamps. Transition probabilities have been measured for several hundred lines (Bisson et al., JOSA B **12**, 193, 1995 and Lawler et al., unpublished), but the number of observed and classified transitions in the range of 340 nm to 1 μm is in excess of 21,000 (Martin, unpublished). Since the prospect for measuring more than a thousand or so of these transitions is rather low, an important question is whether calculation can adequately fill the void. In this case, we are interested only in electric dipole transitions. Furthermore, we require only that the transition probabilities have an average accuracy of $\sim$20%. We will discuss our efforts to calculate a comprehensive set of transition probabilities for neutral Ce using the Cowan (*The Theory of Atomic Structure and Spectra*, 1981) and GRASP (Jönsson et al. Comput. Phys. Commun. **176**, 559-579, 2007) codes. We will also discuss our efforts to quantify the accuracy of the results.

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