Aassessing uncertainties for theoretical atomic data: bound state energies and transition probabilities

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I review the available experimental techniques for providing transition data for atomic systems. Techniques include picosecond spectroscopy and fast-beam-laser interaction for accurate measurements of neutral or near neutral systems, combined laser induced fluorescence (LIF) and branching ratio measurements (method referred to as gold standard for line list data) and finally storage ring and EBIT measurements of long lifetimes in highly charged systems. Then I continue to discuss what impact these experimental data has had on theoretical calculations and their error estimates. To follow up, I discuss what experimental atomic transition data are needed, and to what precision, to further advance our capacity to provide accurate atomic data along with error estimates. Finally I give a report of the activities, experimental and theoretical, in the Computational Atomic Structure (COMPAS[*]) group that are planned in response to the data needs of the fusion community and also to the data needs of the astrophysical community within the GAIA ESO survey.

[*]Homepage: http://ddwap.mah.se/tsjoek/compas/