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Atomic Uncertainties and their Effects on Astrophysical Diagnostics ROBERT SUTHERLAND, Purdue, STUART LOCH, Auburn University, ADAM FOSTER, RANDALL SMITH, Harvard-Smithsonian Center for Astrophysics — The astrophysics and laboratory plasma modeling community have been requesting meaningful uncertainties on atomic data for some time. This would allow them to determine uncertainties due to the atomic data on a range of plasma diagnostic quantities and explain some of the important discrepancies. In recent years there have been much talk, although relatively little progress, on this for theoretical cross section calculations. We present here a method of generating "baseline" uncertainties on atomic data, for use in astrophysical modeling. The uncertainty data was used in a modified version of the APEC spectral emission code, to carry these uncertainties on fundamental atomic data through to uncertainties in astrophysical diagnostics, such as fractional abundances and emissivities, providing uncertainties on line ratios. We use a Monte-Carlo method to propagate the uncertainties through to the emissivities, which were tested using a variety of distribution functions. As an illustration of the usefulness of the method, we show results for oxygen, and compare with an existing line ratio diagnostic which has a currently debated discrepancy.

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