

MODELLING HOT DIFFUSE NON-EQUILIBRIUM PLASMAS WITH ATOMDB

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The atomic database AtomDB (<http://www.atomdb.org>) includes atomic transitions, rates, and wavelengths for elements from $Z=1-30$, focusing primarily on abundant elements and ions that are relevant to X-ray astrophysics. Initially developed in 2001 to model astrophysical plasmas observed with the X-ray grating spectrometers on Chandra and XMM-Newton [1], version 3.0.3 of AtomDB was released [2] in 2016 to address the high-resolution X-ray spectral modeling needs expected from the unfortunate Hitomi satellite. This new release includes detailed inner-shell transitions for all ion stages of all elements $Z<30$, enabling accurate calculations of X-ray spectra from highly non-equilibrium plasmas, both ionizing and recombining.

This talk will describe the modeling capabilities of AtomDB v3.0.3, including comparisons to Hitomi spectra and XMM-Newton observations of supernova remnants and showing improvements from earlier AtomDB and other spectral models. Database access tools using the web and python will also be discussed.

References

- [1] Smith, R. K., Brickhouse, N. S., Raymond, J. & Liedahl, D. 2001, ApJL, 556, 91.
- [2] Foster, A. R. et al, ApJ (to be submitted).