We present HITRANonline, an online interface to the internationally-recognised HITRAN molecular spectroscopic database[1], and describe the structure of its relational database backend[2].

As the amount and complexity of spectroscopic data on molecules used in atmospheric modelling has increased, the existing 160-character, text-based format has become inadequate for its description. For example, line shapes such as the Hartmann-Tran profile[3] require up to six parameters for their full description (each with uncertainties and references), data is available on line-broadening by species other than “air” and “self” and more than the current maximum of 10 isotopologues of some molecules (for example, CO\textsubscript{2}) can be important for accurate radiative-transfer modelling. The new relational database structure overcomes all of these limitations as well as allowing for better data provenance through “timestamping” of transitions and a direct link between items of data and their literature sources.

To take full advantage of this new database structure, the online interface HITRANonline, available at www.hitran.org, provides a user-friendly way to make queries of HITRAN data with the option of returning it in a customizable format with user-defined fields and precisions. Binary formats such as HDF-5 are also supported. In addition to the data, each query also produces its own bibliography (in HTML and BibTeX formats), “README” documentation and interactive graph for easy visualization.


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