HITRANONLINE: A NEW STRUCTURE AND INTERFACE FOR HITRAN LINE LISTS AND CROSS SECTIONS

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We present **HITRAN***online*, 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[3,4] require up to six parameters for their full description (each with uncertainties and references), data is available on line-broadening by perturbers other than "air" and "self" and more than the current maximum of 10 isotopologues of some molecules (for example, CO_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. Examples of access to data that could not be represented in the old format will be given.

To take full advantage of this new database structure, the online interface **HITRAN***online*, available at 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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[2] doi:10.1016/j.jqsrt.2013.04.027, C. Hill, I. E. Gordon, L. S. Rothman, J. Tennyson, A new relational database structure and online interface for the HITRAN database, *JQSRT* **130** 51–61 (2013).

[3] doi:10.1016/j.jqsrt.2013.05.034, N. H. Ngo, D. Lisak, H. Tran, J.-M. Hartmann, An isolated line-shape model to go beyond the Voigt profile in spectroscopic databases and radiative transfer codes, *JQSRT* **129**, 89–100 (2013).

[4] doi:10.1016/j.jqsrt.2013.10.016 [erratum] *JQSRT* **134**, 105 (2014).

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