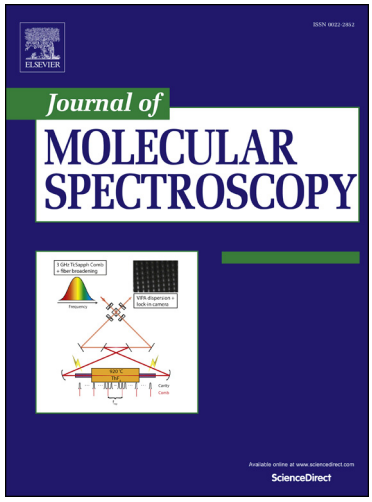

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The ExoMol database: molecular line lists for exoplanet and other hot atmospheres

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Abstract

The ExoMol database (www.exomol.com) provides extensive line lists of molecular transitions which are valid over extended temperatures ranges. The status of the current release of the database is reviewed and a new data structure is specified. This structure augments the provision of energy levels (and hence transition frequencies) and Einstein A coefficients with other key properties, including lifetimes of individual states, temperature-dependent cooling functions, Landé g-factors, partition functions, cross sections, k-coefficients and transition dipoles with phase relations. Particular attention is paid to the treatment of pressure broadening parameters. The new data structure includes a definition file which provides the necessary information for utilities accessing ExoMol through its application programming interface (API). Prospects for the inclusion of new species into the database are discussed.

Key words: infrared, visible, Einstein A coefficients, transition frequencies, partition functions, cooling functions, lifetimes, cross sections, k coefficients, Landé g-factors

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