

The ExoMol project: progress and perspectives

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The ExoMol project aims to provide molecular line lists for exoplanets and other atmospheres with a particular emphasis on those atmospheres which are significantly hotter than the Earth's. The ExoMol database underwent a major reformat and upgrade in 2016; it now provides information on a variety of topics including, of course, line lists, cross sections (generated from the same line lists), lifetimes and Landé g -factors. So far ExoMol has generated line lists for more than 30 key molecular species and more than 20 line lists have been collected from other sources. In 2017, ExoMol was updated with the line lists for NO,² SiH,³ PO, PS,⁴ SH and NS,⁵ ¹⁷H₂O and ¹⁸H₂O.⁶ The update from 2018 will include AlH,⁷ BeH,⁸ SiH₄,⁹ H₂O,¹⁰ C₂,¹¹ C₂H₂, C₂H₄,¹² CH₃Cl,¹³ CH₃F,¹⁴ NH₃ and MgO. Our new flexible code ExoCross can rapidly generate cross sections even from huge line lists. ExoCross also allows facile conversion between ExoMol and HITRAN formats. Methods for efficient production, storage and usage of line lists as well as further data needs will be discussed.

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