

## RECENT UPDATES TO THE HITEMP DATABASE

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The HITEMP database [1] provides line-by-line spectroscopic parameters for use at high temperatures. HITEMP line lists are used for numerous applications that include spectral modeling of exoplanets, brown dwarfs, and stellar atmospheres, as well as the high-resolution remote sensing of combustion environments. It is therefore necessary that these spectroscopic line lists are sufficiently complete in order to reproduce high-temperature spectra, but it is also essential that the line positions, intensities, and broadening parameters are accurate for high-resolution studies. Over recent years, HITEMP has been undergoing a significant upgrade that has improved the quality and extent of the available spectroscopic data and the number of line lists available: H<sub>2</sub>O, CO<sub>2</sub>, N<sub>2</sub>O, CO, CH<sub>4</sub>, NO, NO<sub>2</sub>, OH [1-4]. HITEMP line lists are typically built upon a state-of-the-art *ab initio* (or semi-empirical) line list that is cross-evaluated against other works. The line list is then combined with HITRAN (when possible), and broadening parameters are applied for each line. The resultant line list is validated against available high-resolution experimental studies at elevated temperatures, and improvements are incorporated where necessary. This methodology will be presented for the recent additions to HITEMP [3,4], along with an “effective line” technique that was used for CH<sub>4</sub> [4]. The presentation will also discuss the forthcoming planned updates for the H<sub>2</sub>O and CO<sub>2</sub> line lists.

[1] Rothman, et al. (2010), *JQSRT* **111**, 2139

[2] Li, et al. (2015), *ApJS* **216**, 15

[3] Hargreaves, et al. (2019), *JQSRT* **232**, 35

[4] Hargreaves, et al. (2020), *ApJS* **247**, 55