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**Spectroscopy meets data science to aid planetary remote sensing: the HITRAN and HITEMP databases<sup>1</sup>**  
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The HITRAN spectroscopic database is a backbone of the interpretation of terrestrial and planetary atmospheric retrievals and is an important input to the radiative transfer codes. Apart from atmospheric applications HITRAN is being used in medicine, astrophysics, air-quality monitoring, instrument calibration and many other areas of science and industry. The database is serving the scientific community for nearly half-a-century with every new edition being released every four years. The extent of the updates from edition to edition ranges from updating a few lines of certain molecules to complete replacements of the lists and introduction of additional isotopologues. The most recent release of the database is HITRAN2016 [1]. It consists of line-by-line lists, experimental absorption cross-sections, collision-induced absorption data and aerosol indices of refraction.

Taking advantage of the new structure and interface available at [www.hitran.org](http://www.hitran.org) [2] and the HITRAN Application Programming Interface [3] the amount of parameters has also been significantly increased, now incorporating, for instance, non-Voigt line profiles; broadening by gases other than air and self; and other phenomena, including line mixing.

References [1] I.E. Gordon et al, JQSRT 203, 3 (2017). [2] C. Hill et al, JQSRT 177, 4 (2016). [3] R.V. Kochanov et al, JQSRT 177, 15 (2016)

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