A computed line list for hot H_2CO

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The aim of Exomol project [1] is to produce a comprehensive database of spectroscopic data of molecules relevant towards the characterisation and modelling of (exo)planets and cool stars. The work here presents our most recent addition to the Exomol project; a preliminary line-list of around 3 billion transitions for hot formaldehyde covering frequencies up to 9600 cm^{-1}. This was produced using the variational ro-vibrational solver TROVE [2] using an empirical potential energy surface [3] and a new *ab-initio* dipole moment surface. Computation of high rotational excitations (J up to 70) was performed in order to achieve a comprehensive line-list applicable for temperatures up to 3000K. The fundamental v_1,v_2 and v_5 bands are compared against the available experimental spectra in the HITRAN 2012 database [4,5] at room and elevated temperatures. The fundamental v_3, v_4 and v_6 bands however are compared against the literature [6] as the 250-1620cm^{-1} spectral region is not included for formaldehyde in standard atmospheric and spectroscopic databases.

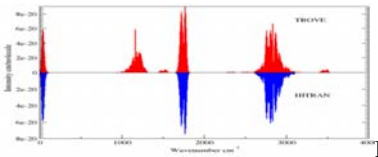

Figure 1. TROVE vs HITRAN

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