THEORETICAL REIMS-TOMSK SPECTROSCOPIC LINE LISTS (THEORETS) FOR MOLECULES OF PLANETOLOGICAL AND ASTROPHYSICAL INTEREST

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Knowledge of intensities of rovibrational transitions of various molecules in wide spectral and temperature ranges is essential for the modeling of planetary atmospheres, brown dwarfs, and for other astrophysical applications. This demonstrates the necessity of having adequate and reliable molecular line lists. The TheoReTS project aims at providing complete and comprehensive lists of transitions based on accurate ab initio \(^1\), \(^2\), \(^3\), \(^4\) and variational \(^5\), \(^6\), \(^7\) calculations for a large variety of highly symmetric molecular species as methane, phosphine, ethylene, etc.. Calculations on new molecular systems as GeH\(_4\), SiH\(_4\) or CH\(_3\)X (X=F, Li, Br, Cl, I) are currently in progress and will be also included in TheoReTS. The development of the TheoReTS website with a dedicated user-friendly graphical interface in frame of Tomsk-Reims collaboration is in progress.

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