

## **I-4. Evaluation of the impacts of recent updates to the HITRAN and MT\_CKD water vapor models on infrared radiative transfer fluxes**

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This study evaluates the effects of recent updates to the High Resolution Transmission (HITRAN) database and the MT\_CKD water vapor continuum model on infrared radiative transfer and remote sensing. It focuses on the impact of newer versions of HITRAN (2016 and 2020) and MT\_CKD (3.2 and 4.1.1) on clear-sky infrared flux calculations across five atmospheric profiles and simulating satellite infrared channels, particularly those of GOES-ABI. Results show that updates to MT\_CKD decrease atmospheric opacity, increasing transmissivity, whereas HITRAN updates generally increase opacity. Significant changes were observed with MT\_CKD updates, affecting upward and downward fluxes. These effects vary across the spectrum, atmospheric heights, and profiles, with notable differences in the far-infrared region due to changes in the water vapor continuum. The study also notes significant spectroscopic changes in HITRAN affecting remote sensing, particularly an average temperature decrease in GOES ABI channel 12, highlighting the importance of ongoing updates and assessments of spectroscopic databases and models for enhancing remote sensing accuracy.