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Spectral Model for Clear Sky Atmospheric Longwave Radiation

Mengying Li, Zhouyi Liao, Carlos F.M. Coimbra

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Highlights

- Develop a spectral radiative model to calculate DLW under clear-sky conditions
- Most up-to-date HITRAN molecular spectral data and MT_CKD model is used
- Absorption and scattering coefficients for aerosols are modeled as Mie scattering
- Without aerosol, the modeled surface DLW agrees within 2.91% with ICRCCM means
- With aerosol, the modeled surface DLW agrees within 3.08% with SURFRAD measurements
- The aerosol forcing is found to be $1.86 \pm 6.57 \text{ W/m}^2$ for $\text{AOD}_{497.5} = 0.1$

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