

Exploring the potential of Satellites to obtain profiles of water vapor isotopes in the troposphere

Abstract:

Satellite based profiles estimates of water vapor isotopes, with discrimination of the planetary boundary from the lower troposphere and upper troposphere, could greatly increase knowledge of evaporation, precipitation, and mixing rates in the troposphere as well as provide new information about the impact of cloud processes on dynamics and tropospheric moisture. Combining satellite based reflected sunlight radiances with thermal IR radiances has the potential to greatly improve the vertical resolution of satellite based water vapor isotope profiles with sufficient precision necessary to capture local to global scale moisture processes affecting isotopic composition. Here we explore new satellite concepts that could potentially profile water vapor isotope measurements using Visible, near IR, and thermal IR radiances.

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