

Preliminary exploration of radiative properties of mixed-phase clouds

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Mixed-phase clouds are ubiquitous in the troposphere. They play important roles in various processes related to radiative energy balance of the Earth system. However, due to their complex nature, mixed-phase cloud optical properties are difficult to calculate and the corresponding cloud radiative effects remain highly uncertain [1].

In this study, we present preliminary results of mixed-phase cloud optical properties calculated based on different internal and external mixing assumptions of ice and liquid water droplets with various sizes and mixing ratios. A comprehensive ice scattering property database [2] is used, and the Lorenz–Mie theory is applied to liquid water cloud droplets. Similar to Yang *et al.* [3], our results show that the mixing process is critical in modulating the optical properties of mixed-phase clouds compared with homogeneous ice or liquid water clouds.

References

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