# Vector radiative transfer properties of inhomogeneous ice clouds in spherical atmosphere

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Clouds composed of ice crystals are an important part of the atmosphere [1–3]. Research on atmospheric radiative transfer properties under an ice cloud condition is helpful to understand the role of ice clouds on remote sensing, atmospheric detection, and many other fields in atmospheric physics. However, the study of radiative transfer properties involving ice clouds have often been based on the assumption that the atmosphere is plane parallel [4–5]. Because of the influence of a spherical atmosphere, this assumption is no longer valid when the solar zenith angle is greater than 70° [6].

Our presentation will compare the vector radiative transfer properties of inhomogeneous ice clouds in plane parallel and spherical atmospheres at 1.55μm. Changes in the ice cloud transmittance and reflectance with effective radius, ice water content, relative azimuth angle, cloud bottom height, and so on will be computed numerically and analyzed in the case of a spherical atmosphere. The effect of ice particle shapes and degrees of roughness on radiative transfer properties will be also analyzed and compared. This research will provide theoretical support for satellite-to-ground laser communication, satellite remote sensing, and other engineering applications.

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## References

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