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Editorial

Remote Sensing of Clouds

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This special issue collects four original and review articles dealing with different cloud aspects, from microphysical properties to macrophysical features. Clouds play a crucial role in modifying the energy budget of the Earth–Atmosphere system through their interaction with solar and longwave radiations [1–3]. Cloud properties (such as spatial location, temperature, horizontal and vertical distribution of liquid/ice water, optical thickness, particle size, and shape) are crucial for determining radiation and heat balance.

Paper one [4] presents an investigation on oceanic warm clouds embedded in multilayered structures, by using spaceborne radar data with fine vertical resolution. Wang et al. [5] conducted a comprehensive investigation on 20 years' of radiosonde measurements and revealed that multilayered clouds account for about 42% of total cloud occurrences; therefore, studies on multilevel clouds are necessary both for the model parameterizations and in the retrieval algorithms [6].

In paper two [7] the authors investigated whether the larger measurement range of Vaisala CL51 ceilometer improves high cloud base detection and the effect of the range-variant smoothing on cloud base detection. Hutchison and D. Lisager in paper three [8] developed a cloud ground truth database for the verification of large-scale numerical simulations. Procedures to create manually-generated cloud analyses exploit phenomenological features to maximize cloud signatures in a variety of remotely-sensed satellite spectral bands, in order to facilitate scene interpretation and to create accurate cloud/no-cloud analyses.

Clouds and snow cover are spectrally-distinguishable, despite having similar reflectance spectra in the visible-light range [9]. The existence of clouds in remotely-sensed images obscures surface features. Therefore, accurate cloud cover detection is vital for earth observations using remote sensing data processing systems, which is the main topic in paper four [10].

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