CLOUD AMOUNT AND AEROSOL CHARACTERISTIC RESEARCH IN THE ATMOSPHERE OVER HUBEI PROVINCE, CHINA

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ABSTRACT:

Recently, more and more investigators concern about global climate change, especially the impact of human activity on these changes, studies show that particles suspend in atmosphere is one important factor effect radiation budget and further influence the change in climate. The basic tenets as follows, aerosols can reflect or absorb sunlight, so they will cool the earth's surface or heat the atmosphere. Moreover, aerosols influence the cloud formation, some clouds contribute to cooling because they reflect some of the Sun's energy and other clouds contribute to warming because they act like a blanket and trap some of the energy Earth's surface and lower atmosphere emit. Depending on their characteristics and height in the atmosphere, cloud and aerosol can influence the energy balance in different ways.

The tradition implement is base on radar and lidar, and always limited in a fixed place. This method can give a more accurate observation, but we should pay attenuation that climate change happen at the global level. Separate observation stations can not fulfill the requirement of global and real-time. First, life cycle of cloud is brief, so distribution of cloud in a region is important. Second, atmospheric motion and other climate phenomena may influence aerosol diffusion, In other words, character of aerosol doesn't only relating to the ground surface. Description above makes the study of relationship between particles and climate change more difficult.

Based on an overall consideration of these two factors, we adopt space-borne observations. In this paper, the observation of CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite) and CloudSat (load cloud profiling radar) are used, contents of the paper not only contain the aerosol optical character and cloud microphysics character, but also analyze the relation between aerosol and cloud, ultimately, use these parameters in climate model. We can found the latest calculation by climate model is more like the factual observation. Cloud amount in summer and spring usually higher than winter and spring and aerosol optical depth is unstable when place and season change.

KEY WORD: radiation budget, aerosol, cloud