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The evolution of the radiative energetic of the Earth - atmosphere system under the cloud cover and cloud microphysical properties change

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The modern climate change as it known from publications is accompanied by growing of the cloud cover around the world along with rising of the temperature of the evaporated surface: ocean and seas. Growing of the cloud cover is attended by the cloud microphysical properties changes. The main cloud characteristics that influence on the system energetic are the cloud water content (CWC) and particle size distribution parameters. The CWC controls the solar and long wave radiation absorption and the second one governs the shortwave radiation scattering process. The scattering of the long wave radiation has some meaning for the upper level clouds. The value of the solar radiation fluxes attenuated by clouds incoming to the underlying surface depends on the cloud microphysical properties. The variation of the CWC from 0,1 g/m3 to 0,2 g/m3 changes the incoming solar radiation on the 40-50 W/m2. The long wave heating of the surface by the incoming fluxes from the cloud low boundary varies approximately on 10-15 W/m2.
As the surface radiation budget plays the main role in the surface temperature formation the cloud cover will produces cooling effect on the surface and the atmosphere. The results of the numerical experiments on the influence of cloud cover values and CWC variations on the surface radiation budget will be presented. The analysis of the surface temperature possible variations will be presented too.