



Assessment of climatic factors influence on interannual changes in the global surface air temperature

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A model to assess a number of factors such as TSI, albedo, cloudiness and greenhouse gases including water vapour affecting global surface air temperature (SAT) changes has been developed. To develop the model solar energy transformation in the atmosphere and the other radiation fluxes transformation were investigated. It's a common knowledge that some part of the incoming solar energy is reflected into space by the Earth's surface, aerosol and cloud particles. A contribution of these components to changes in the reflected solar energy was assessed on the basis of developed linear parameterization. During the period of 2001 – 2010, clouds were found to be the basic contributor to the changes in reflected shortwave radiation. Some part of outgoing terrestrial radiation is retained in the atmosphere by greenhouse gases, water vapour and cloudiness. A contribution of these components to changes in the absorbed longwave radiation was assessed on the basis of developed linear parameterization. It was estimated that the contribution of water vapour was dominant during the analyzed period. The developed parameterization of global albedo made it possible to assess the contribution of TSI to global SAT changes. Making use of the parameterizations listed above the model has been improved. The model calculations showed that the our projections of global SAT to 2030 were lower than IPCC estimates.