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# Modeling of global surface air temperature

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A model to assess a number of factors, such as total solar irradiance, albedo, greenhouse gases and water vapor, affecting climate change has been developed on the basis of Earth's radiation balance principle. To develop the model solar energy transformation in the atmosphere was investigated. It's a common knowledge, that part of the incoming radiation is reflected into space from the atmosphere, land and water surfaces, and another part is absorbed by the Earth's surface. Some part of outdoing terrestrial radiation is retained in the atmosphere by greenhouse gases (carbon dioxide, methane, nitrous oxide) and water vapor. Making use of the regression analysis a correlation between concentration of greenhouse gases, water vapor and global surface air temperature was obtained which, it is turn, made it possible to develop the proposed model. The model showed that even smallest fluctuations of total solar irradiance intensify both positive and negative feedback which give rise to considerable changes in global surface air temperature. The model was used both to reconstruct the global surface air temperature for the 1981-2005 period and to predict global surface air temperature until 2030. The reconstructions of global surface air temperature for 1981-2005 showed the models validity. The model makes it possible to assess contribution of the factors listed above in climate change.