The Greenhouse Effect within an Analytic Model of the Atmosphere

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Within a simplified atmospheric model the greenhouse effect is treated by analytical methods starting from physical first principles. The influence of solar radiation, absorption cross sections of the greenhouse molecules, and cloud formation on the earth's temperature is shown and discussed explicitly by mathematical formulae in contrast to the climate simulations. The application of our analytical results on the production of $20 \cdot 10^9$ t of CO_2 per year yields an enlargement of the earth's surface temperature of $2.3 \cdot 10^{-2}$ °C per year in agreement with other estimations.

Key words: Global Properties of the Atmosphere; Influence of Greenhouse Gases and Clouds; Change of the Temperature.