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## Global indirect aerosol effects: a review

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**Abstract.** Aerosols affect the climate system by changing cloud characteristics in many ways. They act as cloud condensation and ice nuclei, they may inhibit freezing and they could have an influence on the hydrological cycle. While the cloud albedo enhancement (Twomey effect) of warm clouds received most attention so far and traditionally is the only indirect aerosol forcing considered in transient climate simulations, here we discuss the multitude of effects. Different approaches how the climatic implications of these aerosol effects can be estimated globally as well as improvements that are needed in global climate models in order to better represent indirect aerosol effects are discussed in this paper.

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