



## **Satellite derived direct aerosol effect of aerosols above clouds**

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The direct and indirect aerosol effects are still sources of large uncertainties in the understanding of climate and climate feedbacks. Satellite observations may help to reduce these uncertainties. Better understanding of aerosol effects may also substantially improve model parameterisations and subsequently increase the credibility of climate predictions.

This study focuses on the direct aerosol effect when absorbing aerosols reside above clouds. In cloudfree conditions, absorbing aerosols mostly exert a negative radiation forcing through enhancing the shortwave planetary albedo and thus cooling the atmosphere. In situations where absorbing aerosols (e.g. biomass burning aerosol) reside above clouds, they can reduce the shortwave planetary albedo and can therefore exert a positive radiation forcing and warm the atmosphere.

In this study, an attempt is made to quantify this effect solely with satellite data. Data from the A-Train Satellite project is used, as instruments flying on satellites in this constellation provide data necessary for the investigation (e.g. MODIS, OMI, CALIOP, CERES). Up to now, a method for identifying situations in which aerosols reside above clouds has been developed. The results will then be combined with radiation data in order to calculate the planetary albedo and estimate the net effect of the aerosols.