Geophysical Research Abstracts
Vol. 20, EGU2018-19334, 2018
EGU General Assembly 2018

First verification of Aerosol Layer Heights derived from S5P-TROPOMI

Martin de Graaf, Maarten Sneep, Swadhin Nanda, Johan de Haan, and Pepijn Veefkind

Aerosols have important consequences on air quality and climate. Small, toxic particles from industrial and traffic exhausts are known to cause respiratory diseases, while natural aerosols like dust and smoke have strong influences on radiation, cloud formation and precipitation. In order to assess their influence on air quality and climate, it is necessary to know the vertical distribution of aerosols in the atmosphere. Air quality is essentially a boundary layer problem. Climate impacts are much more complex; cloud formation is very diverse, dependent on temperature, humidity, radiation and the availability of cloud condensation nuclei, and the vertical distribution of all these parameters in the atmosphere. The altitude of aerosols acting as cloud condensation nuclei relative to the altitude of clouds is very important to understand the (indirect) effect of aerosols on clouds. Furthermore, semidirect effect of aerosols (effect of aerosols on clouds through absorption and scattering of radiation) is also strongly dependent on aerosol vertical distribution. Another aspect is the altitude of volcanic ash layers, which are needed to inform aviation on save aircraft routes. Especially the initial injection heights of ash layers are essential for chemical transport models.
The S5P-TROPOMI Aerosol Layer Height (ALH) algorithm is a newly developed product that provides the average height of aerosol layers detected in the Earth's atmosphere. It is based on an Optimal Estimation scheme that provides the ALH for cloud-free TROPOMI pixels that have a given high aerosol load. The first results from this new product will be shown and a first verification will be provided.