



## **Aerosol transport along the Andes from Amazonia to the remote Pacific Ocean: A multiyear CALIOP assessment**

Quentin Bourgeois (1), Annica Ekman (1), and Radovan Krejci (2)

(1) MISU, Stockholm University and Bolin Centre for Climate Research, Stockholm, Sweden, (2) ITM, Stockholm University, Stockholm, Sweden

The free troposphere over South America and the Pacific Ocean is a particularly interesting region to study due to the prevailing easterly wind direction, forcing air over Amazonia towards the Pacific Ocean but encountering a natural barrier - the Andes - in between which might play a significant role. In addition, the strong contrast between the wet, relatively clean season and the dry, relatively polluted season as well as the difference between day and night meteorological conditions may influence the vertical distribution of aerosols in the free troposphere. Six years (2007-2012) of CALIOP observations at both day and night were used to investigate the vertical distribution, transport and removal processes of aerosols over South America and the Pacific Ocean. The multiyear assessment shows that aerosols, mainly biomass burning particles emitted during the dry season in Amazonia, may be lifted along the Andes. During their lifting, aerosols remain in the boundary layer which makes them subject to scavenging and deposition processes. The removal aerosol extinction rate was quantified. After reaching the top of the Andes, free tropospheric aerosols are likely pushed by the large-scale subsidence towards the marine boundary layer (MBL) during their transport over the Pacific Ocean. CALIOP observations may indicate that aerosols are transported over thousands of kilometers in the free troposphere over the Pacific Ocean. During their long range transport, aerosols could be entrained into the MBL and may further act as cloud condensation nuclei, and influence climate and the radiative budget of the Earth.