Geophysical Research Abstracts
Vol. 19, EGU2017-2521, 2017
EGU General Assembly 2017

On the impact of clouds on the energy balance of the Antarctic Peninsula Ice Sheet

Marta Caballero, Matthias Braun, and Thomas Mölg
Institut für Geographie, FAU Erlangen-Nürnberg, Germany (marta.caballero@fau.de)

Radiative effects of clouds play a key role in the energy balance of the atmosphere and have a critical influence on the ice sheet's radiation budget, causing a warming effect (by absorption and emission of longwave radiation) or cooling effect (by reducing the downwelling shortwave radiation) at the surface. On the Antarctic Peninsula, changes in the glacier system have been observed, such as the disintegration of ice shelves, acceleration and thinning of glaciers, variations in the limits between glacier faces and retreat of glacier fronts. However, rising surface air and ocean temperatures, as well as substantially increased snow fall in some regions, are also known. These tendencies were linked to changes in atmospheric circulation. Hence, a better understanding of the processes and mechanisms leading to such changes is required. The role of clouds has not been well studied yet in this context. Here, preliminary retrievals of satellite-derived cloud macrophysical and microphysical properties in the Antarctic Peninsula will be presented. The data will be analyzed in the special light of improving parameterizations in the Polar Weather Research and Forecasting model. This has the goal to ultimately enhance our understanding of how variations in the cloud cover and properties impact the energy balance on the Antarctic Peninsula at regional scales.