



An objective circulation pattern classification for the Antarctic Peninsula Region

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Large interannual variability has been observed in the region of the Antarctic Peninsula, as after profound atmospheric warming in the second half of the 20th century, widespread cooling followed (Turner et al., 2016). In 2004–2007, the Czech Antarctic Mendel Station was built on James Ross Island (eastern Antarctic Peninsula) and since then, intensive multidisciplinary research has been performed. Particularly the current research focused on evaluation of the impacts of climate variability on cryosphere would benefit from a synoptic-climatological study in this region that has so far been a little investigated.

In this contribution, an objective circulation pattern classification for the Antarctic Peninsula region (48–81° S, 30–90°W) is presented. The analysis is based on ERA-Interim reanalysis data, specifically the daily mean sea level pressure anomalies for the period 2005–2015. Due to uncertainties in calculating sea level pressure over high Antarctic terrain, all values from grid points with altitude above 500 m a. s. l. were removed from the analysis. In order to obtain the circulation patterns, the self-organizing maps technique, implemented in the MATLAB software, was used. The self-organizing maps were set up and run several times with the number of circulation patterns to identify ranging from six to forty-two. The final number of circulation patterns is decided based on selected statistical indices (Huth et al., 2008) and then compared with recent findings on pressure field variation around Antarctic Peninsula. The evaluation of the classification is performed by mapping the daily mean sea level pressure data from 2016 to the distinguished circulation patterns. In future, the classification will be used for assessment of near-surface air temperature field, especially above glaciated areas of James Ross Island to clarify atmosphere-glacier interactions.

Huth, R. et al. (2008): Classifications of Atmospheric Circulation Patterns – Recent Advances and Applications. *Annals of the New York Academy of Sciences: Trends and Directions in Climate Research*, 1146, p. 105–152.

Turner, J. et al. (2016): Absence of 21st century warming on Antarctic Peninsula consistent with natural variability. *Nature*, 535, 7612, p. 411–415.

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