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Climate change in the Antarctic Peninsula region and the role of the El-Nino phenomenon

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Assessment of climate change in the Antarctic Peninsula (AP) region, the 'hot climate point' in Antarctica is the main purpose of the research. Alignment of the positive trend in the near-surface air temperatutres (SAT) is observed on regional stations after an episode of warming in the lower troposphere in the latest decades of the 20th century, although temperatures remain warmer the climatic norms. Following the persistent westerlies cutting the cold air from Antarctic continent, general smoothening of SAT ranges on time scales from daily to inter-annual is manifested to the greatest degree on western side of AP.
Recent warming period is characterized by the type of regional atmospheric circulation with prevailing cyclogenesis in the Bellingshausen Sea, which favors local air flow transformations over the mountains of the Antarctic Peninsula - an additional factor of warming.
Method of objective classification of atmospheric circulation types by their probability is applied to show mechanism of climate change in the AP region as well as to display teleconnections with tropical regions.. Increasing temporal residence of the predominant atmospheric circulation types has been characteristic feature of current climate mostly on account of quasi-blocking events. During the warm El Niño phase anticyclogenesis prevails in the West Antarctic sector, and during La Niña enhanced cyclogenesis is developed. Recent decade have seen the transition from the positive to negative El Niño phase, that was followed by some decceleration in the increasing SAT; some seasons became colder, causing increasing concentration in the sea ice.
A high synchronous and asynchronous correlation is found between SAT anomalies in the Antarctic Peninsula and El Niño indexes; the best correlation showed index El Niño 1-2 in the Eastern Pacific. Regression and alternative forecast schemes for the monthly SAT are calculated for Vernadsky station with 2-3 months advance, with the best skill for the cold half of the year (May-September). Accuracy of the forecast of positive monthly SAT anomalies is somewhat higher than the forecast of colder air temperatures. The need for further research is indicated, as we have a restricted set of El Niño episodes.