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Title: (IWG3C) Large-scale variations of sea level in the Southern Ocean

Abstract:

The Southern Ocean provides a major link among the world oceans a link to the vast Antarctic ice sheet. Here, recent topics on large-scale level variations around Antarctica and in the Southern Ocean are pres and their relationship with atmospheric variations will be investigated Recently, the annular mode is found to be the primary pattern in atm variations in the troposphere of the Southern Hemisphere. The zonall coherent structure over the whole Antarctic region can have significar impact on the Southern Ocean. Coherent sea level variations at Antar coastal stations were clearly detected on intraseasonal time scales.[1 The coherent variations had significant negative correlations with an i the atmospheric annular mode variation. The negative correlation is consistent with the mechanism that a high (low) westerly anomaly le stronger (weaker) northward Ekman drift and causes divergence (convergence) around Antarctica. Off the Antarctic coasts, the sea lev variations are confined in the basins, but still have large spatial exten [4]. For the interdecadal time scales, a coherent warming of the subs layer over the Southern Ocean [5]. Significant watermass changes ha detected in the Indian Ocean sector, and observed changes in geopot anomaly are consistent with an increase in gradient across the Antarc Circumpolar Current, indicating an increase in strength of the ACC. Th be expected by the increased strength of the westerlies correspondin intensification of the Antarctic Oscillation. Long-term observations are limited around the Antarctic coasts. Two stations (Faraday/Vernadsky Syowa) have records longer than 20 years, but the accuracy of the observations is not enough due to the sea ice cover. Establishing the monitoring network around Antarctica is crucial for the long-term cha detection. References [1] S. Aoki , Geophys. Res. Lett. 29, (2002). [2 Hughes et al., Geophys. Res.Lett. 30, (2003). [3] L. Fu, J. Phys. Ocea 33, 436-449 (2003) [4] M. Meredith and C. Hughes, J. Geophys. Res. c03102 (2004) [5] S.Gille, Science, 295, 1275-1277(2002).

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