

Antarctic Peninsula warming from model simulations

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Significant surface air temperature (SAT) increase has been observed during the last decades in the Southern Hemisphere over the Antarctic Peninsula (Turner and Pendlebury, 2004; Karpenko et al., 2005; Turner et al., 2005; Mokhov et al., 2006). In this paper, we analyze the ability of global climate models to simulate the observed tendency of warming near surface in the Antarctic Peninsula region with an assessment of possible temperature changes in the 21st century. In particular, simulations with general circulation models HadCM3 and HadGEM1 for the 4th IPCC Report (Climate Change, 2007) with the SRES-A1B and SRES-A2 scenarios are used as well as simulations the IAP RAS climate model (CM) of intermediate complexity.

Figure 1 shows the SAT changes (relative to 1961-1990) for the Bellingshausen station from model simulations in comparison with observations. The SAT increase from observations for this region is reproduced realistically by the models. General tendency of temperature increase for the 21st century from the model simulations is accompanied by remarkable variations, in particular in the first half of the century from HadGEM1 and HadCM3 simulations. The total SAT increase to the end of the 21st century relative to the end of 20th century according to model simulations for this region is estimated about 1.5 K for HadCM3, in the range 2-3 K for HadGEM1 and about 2.3-2.8 K for IAP RAS CM.

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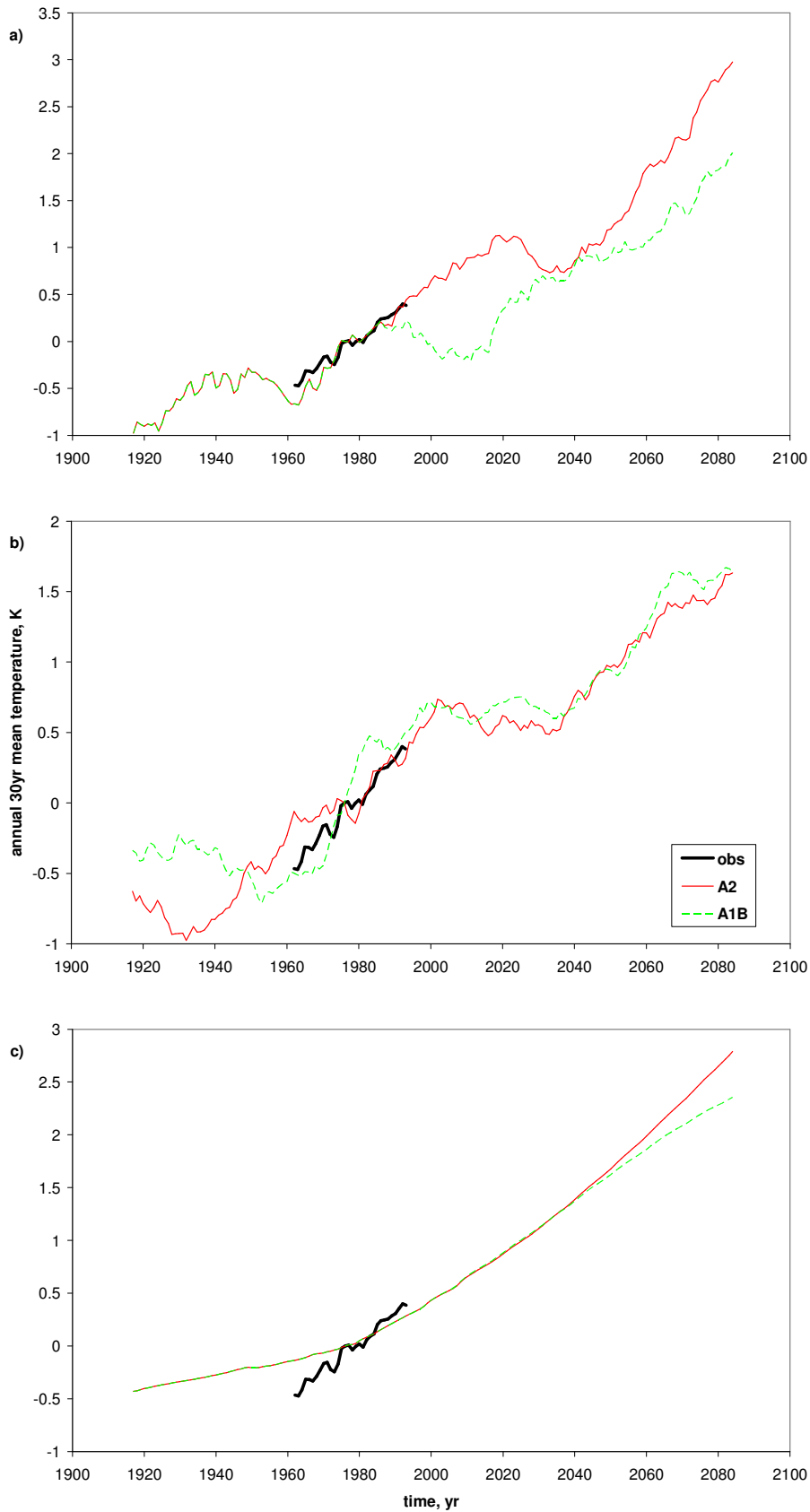


Figure 1. Changes of the SAT 30-year running means (K) for the Bellingshausen station region from observations and model simulations: a) HadGEM1, b) HadCM3, c) IAP RAS CM.