



Changes of temperatures and of the water isotopic composition in Western Siberia during the last five decades - Results from a transient simulation combined with new observations from Kourovka Observatory

Martin Butzin (1), Martin Werner (1), Vladislav Bastrikov (2,3,4), Jean-Louis Bonne (3), François-Marie Bréon (3), Olivier Cattani (3), Konstantin Griбанov (2), Jean Jouzel (3), Valérie Masson-Delmotte (3), Nikita Rokotyan (2), and Vyacheslav Zakharov (2)

(1) Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany (martin.Butzin@awi.de), (2) Climate and Environmental Physics Laboratory, Ural Federal University, Ekaterinburg, Russia, (3) Laboratoire des Sciences du Climat et de l'Environnement / Institut Pierre Simon Laplace, CEA, Saclay, France, (4) Institute of Industrial Ecology, Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russia

While the rate of global warming averaged over the last 50 years amounts about 0.1°C per decade, boreal regions such as Siberia have been warming at considerably higher rates. The warming should affect the isotopic composition of meteoric water, with the temperature effect being stronger in high latitudes than in the global average. Unfortunately, isotope records of boreal precipitation are sparse and discontinuous, and measurements of the isotopic composition of boreal water vapour have started only recently. On the other hand, the isotopic response to warming could be detected in transient climate simulations by means of an isotope-enhanced general circulation model. Here, we present first results of such an ongoing transient simulation using the isotope AGCM ECHAM5-wiso. During the simulation the model is nudged to reanalysis data to keep the non-isotopic state of the atmosphere close to meteorological observations between 1958 and 2013. We focus on Western Siberia where our simulation is complemented and validated with continuous observations of isotopes in water vapour and precipitation starting in 2012.

This work is partly supported by a grant of the Russian Ministry of Education and Science, contract No. 11.G34.31.0064.