Geophysical Research Abstracts, Vol. 9, 05621, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-05621

How reliable is Eurasian snow cover as a seasonal climate predictor?

C.G. Fletcher (1), P.J. Kushner (1) and J. Cohen (2)

(1) Atmospheric Physics Group, University of Toronto, 60 St George St, Toronto, M5S 1A7, Canada (cgf@atmosp.physics.utoronto.ca), (2) AER Inc., 131 Hartwell Avenue, Lexington, MA 02421

This paper reexamines the question of whether autumn Eurasian snow cover provides seasonal predictability for Northern Hemisphere winter climate anomalies. Previous observational and modelling studies have shown that predictability from snow cover may arise through excitation of an annular-mode signature in the stratosphere, with subsequent downward propagation from the stratosphere back to the surface on a timescale of several weeks. Robust lower-tropospheric precursors of these stratospheric events are difficult to find because of strong natural variability in the winter polar stratosphere. We demonstrate the reliability of a snow-forcing mechanism for these events using an 80-member ensemble of integrations using the Geophysical Fluid Dynamics Laboratory Atmosphere/Land model AM2/LM2. These idealised experiments place a useful bound on the predictability that can be expected from using Eurasian snow cover as a predictor, and also provide insight into the dynamics of the large-scale circulation response to snow forcing.