1050-86-60 **William F. Langford*** (wlangfor@uoguelph.ca), Dept. of Mathematics and Statistics, University of Guelph, Guelph, Ontario N1G 3C5, Canada, and **Greg Lewis**. *Poleward Expansion of Hadley Cells.*

Recent reanalyses of meteorological data by climate scientists have indicated that the Hadley cells of the atmospheric circulation are expanding toward the poles as well as slowing in their circulation velocity. A majority of GCM simulations forecast that these trends will continue at least to the end of the 21st century. If true, the poleward expansion of Hadley cells would lead to desertification of economically important regions. Similar reanalyses of meteorological data for recent decades show a poleward movement of the jet streams that affect midlatitude weather. Although the precise mechanism of these changes in Hadley cells and jet streams is not fully understood, it is believed to be linked with global warming. In this paper, we apply pseudo-arclength continuation to a model of a fluid in a differentially heated rotating spherical shell that uses the Navier-Stokes equations in the Boussinesq approximation. We demonstrate that a decrease in the pole-to-equator temperature gradient leads to an expansion and slowing of the Hadley circulation and a poleward movement of jet streams, thus indicating a possible mechanism for the observed changes.

(Received February 22, 2009)