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Overview of modes of low-frequency variability in the Southern Hemisphere

R. Huth (1,2), R.A. Maenza (3), and R.H. Compagnucci (3)

(1) Charles University, Faculty of Science, Dept. of Physical Geography and Geoecology, Praha 2, Czech Republic (huth@ufa.cas.cz, +420 2 21951367), (2) Institute of Atmospheric Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic, (3) Dept. of Atmospheric and Ocean Sciences, University of Buenos Aires, Ciudad Universitaria, Buenos Aires, Argentina

In the Northern Hemisphere (NH), the modes of variability of tropospheric circulation on intra-seasonal timescales (also referred to as teleconnections) were described in detail several decades ago. Somewhat surprisingly, a similar description for the Southern Hemisphere (SH) is lacking; a possible reason for this is that the atmospheric circulation in the SH is more transient and less stationary than in the NH, which may have downplayed the importance of the modes for the description of the SH circulation. The only three exceptions that have been described and discussed in detail, including the temporal changes and effects on surface climate elements, are the Southern Annular Mode and two Pacific-South American modes. In the contribution, we present an overview of all the modes of the low-frequency circulation variabiltiy in the Southern Hemisphere extratropics, in all seasons, detected by rotated principal component analysis of monthly mean values of 500 hPa heights. We provide evidence of the physical realism of the modes by comparing them with correlaton maps, and we discuss their possible connections with the sources of variability outside the SH extratropical troposphere, such as Southern Oscillation and ozone depletion.