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GT: Estudos de Modelagem de Tempo e Clima

DYNAMIC AND RADIATIVE EFFECTS OF STRATOSPHERIC OZONE ON ATMOSPHERIC BLOCKING IN SOUTHERN SOUTH AMERICA

Mateus Dias Nunes[1], Simone M. C. Sievert Coelho[2], Paulo Yoshio Kubota[3], Michaela I. Hegglin[4]

ABSTRACT

The present research aimed to identify the patterns associated with exchanges in the Upper Troposphere and Lower Stratosphere and the relationship between stratospheric ozone and atmospheric blocking. Eighteen cases of atmospheric blocks that occurred in the region between the Southeast Pacific and the South Atlantic in the period between 2000-2015 for the winter months of June-July-August (JJA) were selected. To describe the processes that occur in the stratosphere-troposphere coupling, mass flux, and rates of radiative heating and cooling at high levels of the atmosphere were evaluated. It was observed that the intrusion of a stratospheric is characterized by potential anomalies of vorticity and a high concentration of stratospheric ozone in the atmospheric column. Through the analysis of the dynamic tropopause and based on the ozone content within an atmospheric column, the anomalies of potential vorticity coincided with regions with the largest amounts of the ozone column and downward flux, favoring the intrusion of stratospheric ozone into the upper troposphere region. In the region of the atmospheric block, positive temperature anomalies higher levels are observed and are associated with rates of radiative heating/cooling due to variations in ozone in the stratosphere. Besides, the vorticity anomalies between 1.5 and 2 PVU contributed to the decrease of the geopotential height in the tropospheric column that favors the formation of the atmospheric blocking.

PALAVRAS-CHAVE: Total Ozone Column, Stratosphere-Troposphere, Potential Vorticity

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[1]   Estudante de Pós-Graduação PGMET/INPE - Professor IRN/UNIFEI
[2]   Pesquisadora DSA/CPTEC/INPE
[3]   Pesquisador DMD/CPTEC/INPE
[4]   Pesquisadora Universidade de Reading (UK)