Geophysical Research Abstracts
Vol. 20, EGU2018-1102, 2018
EGU General Assembly 2018

Interannual variability of water vapor transport through the monsoon regions

Nuria Pilar Plaza, Cristina Peña, and David Gallego
Universidad Pablo de Olavide, Dpto. Sistemas Físicos, Químicos y Naturales, Sevilla (Spain)

Water vapor concentration in the lower stratosphere (LS) is mainly driven by transport from the troposphere. In this region transport through the Asian and North American monsoons plays a mayor role, controlling water vapor content of the annual cycle wet phase. However, despite its importance, there is much uncertainty about the physical mechanisms that control water vapor through these regions. In addition, LS water vapor over monsoon regions is modulated by the quasi-biennial oscillation (QBO) and El Niño-Southern Oscillation (ENSO) although the mechanisms of these interactions remain uncertain.

Here, the Lagrangian particle transport model FLEXPART, being initialised with ERA interim data, is used to study water vapor transport to the LS through the Asian and North American monsoon regions. From a 37-year climatological perspective and considering the whole amount of air parcels given by the model, it is possible to determine those regions and physical features that have an strong influence on LS water vapor. The reconstruction of water vapor trajectories and the identification of source and dehydration regions allow us to recognise the interannual changes induced by the QBO and ENSO signals on water vapor along its pathway to the LS as well as to investigate the physical mechanisms that explain these interactions.