Supplement of

Climatology of Lyapunov exponents: the link between atmospheric rivers and large-scale mixing variability

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Seasonal effects on the FTLE climatology

Figures 1,2 account for the seasonal effect observed in the FTLE climatology for the period 1979 – 2014. Note the largest values of the FTLE alternate between southern and northern hemispheres along the whole period. As observed in Figure 1 in the main text, three latitudinal bands are also clearly visible in the Hovmöller diagram. Note that the maximum values are observed for mid-latitudes.

Figure 1. Seasonal mean for the backward FTLE based on the 35 years timeseries for the seasonal periods; (a) DJF, (b) MAM, (c) JJA, and (d) SON. Note the largest values of the FTLE for the northern/southern hemisphere during the winter season.
Correlation between the FTLE time series and ENSO indices

Figure 3 shows the monthly backward and forward FTLE time series and the Southern Oscillation Index (SOI) for the 1979-2014 period. The FTLE series are anticorrelated with the SOI index, with correlation coefficients $-0.85$ and $-0.67$, respectively.

Precipitation rates in Sahara and British Isles due to Atmospheric Rivers

Figure 4 shows the rainfall rates measured in the Sahara-Morocco (a) and British Isles (b) regions coinciding with a landfall atmospheric river. Precipitation rates are shown as a percentage out of the total retrieved from Sheffield et al. (2005).
Figure 4. Ratio of daily precipitation coinciding with an atmospheric river detection out of the total, for the Sahara-Morocco (a) and UK-Ireland (b) regions. The database of precipitation used in this analysis is the global rain data retrieved from Sheffield et al. (2005). This global high-resolution dataset has been constructed by the combination of observational and reanalysis data from the NCEP-NCAR.

References