

# Investigations of the moisture budget of the tropical atmosphere using ERA interim data

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The tropical atmospheric circulation (TAC) carries huge amounts of moisture and thus constitutes an important fragment of the global water cycle. Some elements of the TAC, such as the Hadley Cell, even extend to the extratropics. Thus changes in the intensity of TAC and of tropical moisture transports can impact the characteristics of precipitation inside as well as outside the tropics.

Recent studies have found contradicting results whether TAC has intensified or weakened in recent past. We here have made first steps to reinvestigate changes in TAC and in tropical moisture transports.

We therefore divided the tropics between  $\pm 30^\circ$  latitude into regions with upward and downward vertical wind motion, presenting the ascending (ASC) and descending (DESC) branches of TAC. Typically moisture is advected from DESC into (out of) ASC at the lower (upper) levels of the atmosphere. The moisture budget of ASC has been calculated in terms of the difference between precipitation and evaporation (P-E) and in terms of moisture fluxes along the boundary separating ASC and DESC.

In addition to mean values often used for calculating moisture transports we here also used instantaneous moisture values and wind vectors. We thereby found large discrepancies not only in the amounts of transports, but also in the resulting timeseries of the statistical properties and vertical profiles.

Thus we here highlight the importance of using instantaneous values instead of mean values over time.