



## **Information flow associated with precipitation in coupled and uncoupled regional climate simulations**

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A high resolution regional coupled model COSMO-NEMO is coupled over the Mediterranean Sea and used for climate simulations for the period 1979-2011 over European region. It is observed that coupled simulations produce a significantly different climatology than the uncoupled simulation. In order to access the difference in the information flow or casual association in the two models we adopted the methodology suggested by S.X.Liang (2016). The information flow/transfer is rigorously derived from the fundamental roots of Shannon entropy. The current work focusses on the summer (JJA) daily precipitation and its causality with other variables.

From the available high resolution observations, it is seen that a significant amount of information is transferred from daily sea surface temperatures (SST) over the northwest Mediterranean Sea to daily precipitation over the alps and central Europe. The information flow path considerably matches with the Vb events which bring anomalous rainfall over those regions. It is observed that coupled model significantly captures the same information pathway as in the observations unlike the uncoupled model. It might be noted that the coupled mode has a high resolution SST derived from NEMO unlike the uncoupled mode with course resolution SST obtained from ERA reanalysis. This and more results to be shown indicate that the information flow in the coupled mode matches better with the observations than in the uncoupled mode.