



## **Interannual variability of the Atlantic Cold Tongue heat budget**

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The processes governing the Atlantic Cold Tongue (ACT) development are now better understood, but the mechanisms of its interannual variability are still unclear. The aim of the present study is to explore the mechanisms leading to the cold tongue formation during cold and warm ACT events. Cold and warm ACT events are classified statistically from several datasets following a criteria derived from Richter et al. (2013) and slightly adapted. This classification allows to analyse composites of extreme events. In particular, composites of the mixed layer heat budget have been calculated, computed online in a forced global ocean model. This mixed layer heat budget is a good tool to identify the oceanic processes which control the formation of the ACT and its variability.

The results show that the turbulent mixing at the base of the mixed layer plays a dominant role controlling the ACT formation. Cold (warm) events are associated with strong increase (decrease) of the turbulent mixing from march to July.

In addition horizontal the advection anomalies are opposite during cold and warm events in June-July. The positive (negative) anomalies during cold (warm) events tend to damp (enhance) the ACT. During warm events, the advection process is responsible of the ACT formation with almost the same intensity as when averaged over all.