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Modelation of oceanic thermal response to hurricane in the Gulf of Mexico

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Abstract

A thermodynamic model applied to the marine mixed layer of the Gulf of Mexico has shown that the effect of a hurricane over the sea surface is cooling of the water on surface. This cooling is produced mainly by the cold water penetration through the thermocline and secondly by the sensible and latent heat flows.

In this work the study case is the hurricane Lili (2002) which is simulated with an single model of cyclone vortex which induces asymmetric winds through path.

We carried out numerical experiments in order to study the impact of different model resolution. These experiments include two grids 25km and 10km between points in the region of integration Gulf of Mexico, NW Caribbean Sea and east coast of Florida.

The results then show different cooling in each case as the resolution increased the cooling increased.

The model shows a cooling which is larger on right side of asymmetric vortex in where the winds are more intense.

The mixed layer depth increased on the side of the asymmetric wind.