Two-dimensional non-hydrostatic numerical study of conditional symmetric instability

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The presence of conditional symmetric instability in the saturated core of severe marine storms determines their internal structure, and it is a pre-requisite for the occurrence of a stronger baroclinic development. The assumption of a slantwise convective adjustment taking place on shorter time and space scales strongly influences the modeling of larger scale circulations. We use a 2-D version (MOLON) of the full non-hydrostatic model MOLOCH, developed at ISAC-CNR, to study the whole life-cycle of moist symmetric instabilities in idealized conditions representing the environment of severe Mediterranean storms. It has been shown in previous analytical and numerical studies that the most unstable "symmetric" mode is not aligned with the shear vector. We approach this problem with the use of a rotated basic state and obtain indications for the subsequent use of the full 3D model.