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# Convection in the Mediterranean Sea: impact of the spatial resolution Convection in the Mediterranean Sea: impact of the spatial resolution

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The convection in the major basins of the Mediterranean Sea is investigated using the results of a high resolution model (MED16) forced both by the recent re-analyses and analyses of the European Center for Medium-range Weather Forecast (ECMWF). The MED16 model has been developed in the context of the Mercator project. The numerical code is an extended version of the primitive equation model OPA with a rigid lid. The horizontal grid resolution is 1/16 degree and the model uses 43 vertical z-levels. The model initial state was provided by the MODB4 climatology. The simulation began in January 1987 and the model was forced by daily air-sea fluxes and winds from January 1987 to February 1998 by the second ECMWF re-analyse (ERA40, 1.125 by 1.125 degree). Then two experiments were conducted with daily forcing from March 1998 to June 2002: MED16-ERA40 forced by ERA40 and MED16-ECMWF forced by the ECMWF analyses that have a better spatial resolution (0.5 by 0.5 degree). In winter, the convection is compared in the major basins of the Mediterranean Sea between MED16-ERA40 and MED16-ECMWF experiments for five consecutive winters. Occurence and date of the convection, hydrographic properties of the major water masses formed during convection phenomena, depth maximum reached by the convection, and rate of water mass formation, are diagnosed for the two experiments. The comparison highlights and quantified differences. In particular, it shows the need of high spatial resolution atmospheric forcing to simulate realistically the convection. In particular, in the Gulf of Lions, the convection was badly represented in MED16-ERA40.