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Circulation Structures from Sea Surface Elevation and Wind Fields in the Malta-Sicily Channel

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The spatial and temporal variabilities and main forcing functions (wind stress, thermohaline forcing, etc) of the Malta-Sicily channel (MSC) are important for the Mediterranean sea, since it is exposed to possible oil spills associated with the heavy marine traffic due to the MSC host the largest fishing fleets in the mid-Mediterranean; at the same time such dynamical processes influence the biological transport and are relevant from the productive and environmental point of view. In this work, a geostrophic current field is computed out from AVISO sea surface elevation datasets (SSH), in order to identify the main circulation structures. On the other hand, vorticity, wind stress and wind stress curl are calculated from the scatterometer wind fields, to check how strong the influence of the wind is in the area. Finally, we perform EOF analysis on the SSH datasets to recognize the recurrent structures, in which we identify a dipole on the 1st mode, that could explain the Atlantic Ionian stream formation (which is in part bathymetrically constrained), as well as the BiOS mechanism on the 2nd mode. The studied time spans is 24 years long, 1987-2011 for the wind data and 22 years, 1992-2014 for the SSH.