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An Angular Momentum Eddy Detection Algorithm (AMEDA) applied to coastal eddies

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We present a new automated eddy detection and tracking algorithm based on the computation of the LNAM (Local and Normalized Angular Momentum). This method is an improvement of the previous method by Mkhinini et al. (2014) with the aim to be applied to multiple datasets (satellite data, numerical models, laboratory experiments) using as few objective criteria as possible.
First, we show the performance of the algorithm for three different source of data: a Mediterranean 1/8° AVISO geostrophic velocities fields based on the Absolute Dynamical Topography (ADT), a ROMS idealized simulation and a high resolution velocity field derived from PIV measurements in a rotating tank experiment. All the velocity fields describe the dynamical evolution of mesoscale eddies generated by the instability of coastal currents.
Then, we compare the results of the AMEDA algorithm applied to regional 1/8° AVISO Mediterranean data set with in situ measurements (drifter, ARGO, ADCP...). This quantitative comparisons with few specific test cases enables us to estimate the accuracy of the method to quantify the eddies features: trajectory, size and intensity.
We also use the AMEDA algorithm to identify the main formation areas of long-lived eddies in the Mediterranean Sea during the last 15 years.