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Mediterranean Sea EKE variability from 11 years of altimetric data. MERCATOR model capability to reproduce it.

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The EKE variability of the Mediterranean Sea from eleven years (1993-2003) is studied with merged (T/P, Jason, ERS and Envisat) altimetric data. A relatively accurate description of the mean EKE distribution is given for the Mediterranean Sea. This mean EKE structure is the consequence of the complex merging of the different component of the temporal variability. The mesoscale, seasonal and interannual component play a key role but the signature of decadal signals and sporadic events also play an important role in the variability. Additionally, different behaviours are observed for each basin (Western, Ionian and Levantine). Both annual and interannual variations are more pronounced in the eastern part of the basin. In the western side, mesoscale activity is relatively stable except South-West of Sardinia where energy presents important seasonal and interannual variations. In the Ionian Sea, the EKE variations are mainly linked to the reverse of the circulation occurring in 1997 since a strong EKE positive trend, coupled with an increase of the seasonal cycle amplitude, is observed in 1997 in the central Ionian. In the Levantine Sea, EKE variability is meanly influenced by the Ierapetra eddy and Mersa-Matruh area. However, the two structures display different processes of variability.

In a second time, EKE variations deduced from MERCATOR PAM and PSY2v1 modelling data are confronted to the EKE variability seen by altimetry. The results show that EKE is an excellent tools to underlines model shortcoming and properties. Without assimilation, even if the model well reproduces SLA seasonal and interannual variations, it does not correctly retrieve EKE variations mainly because it is too stable. Nevertheless, SLA assimilation considerably improves the model performance.