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Poster
Probability Density Functions (PDF) for both (zonal and meridional) velocity components are presented which were inferred from the 3-year long Jason-1 - TOPEX/POSEIDON Tandem Mission (JTP). Results are compared with those obtained form longer time series of geostrophic velocities and SSH inferred form the 19-year 1/3° weekly AVISO SSH anomaly fields from the TOPEX/POSEIDON, Jason-1 and Jason-2 (TPJJ) missions. The differences in the zonal and meridional components are found to be evident, with a slightly wider shape for the zonal velocity component due to the larger variability in zonal direction.
Our results confirm that the exponential shape of the global velocity PDF is a consequence of the spatially inhomogeneous EKE distribution over the global ocean. Hence, the exponential shape is the result of averaging Gaussian PDF with differing PDF-width. As a result, regions that only have a small variance in EKE, have a Gaussian shaped PDF, whereas regions that have a large variance in EKE, show a rather exponential shaped PDF. Accordingly, normalizing any regional velocity PDF with their standard deviation also results in a gaussian PDF independent from the regional extend.
To further describe the behavior of the PDF, skewness and kurtosis is calculated for the first time for both velocity components individually as well as for the underlying SSH. The skewness and kurtosis of the velocity and SSH fields appear to identify the mean path of unstable ocean jets as well as regions dominated by eddies and they complement each other in the description of the actual structure of the eddy field. Using the longer 19-year time series of SSH and velocity results in clearer structures of skewness and kurtosis.
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