**Scatterometer-based ocean wind forcing fields**

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Surface winds derived from earth Observation satellites are increasingly required for use in monitoring and forecasting of the ocean. A drawback of space-borne wind observing systems, such as scatterometers, is that they provide time and space coverage unsuitable for, among others, high-resolution ocean model forcing. As such, blended ocean forcing products combining scatterometer data and numerical weather prediction (NWP) output, are being developed over the past few years. These products, which provide full global coverage at increased temporal resolution (e.g., daily), however, generally only resolve spatial scales closer to NWP-resolved (200km) rather than scatterometer-resolved scales (25 km). Therefore, information on wind-current interaction, on the diurnal wind cycle and on wind variability in moist convection areas is lost in these blended products. Moreover, known systematic NWP model (parameterization) errors are propagated in the blended products at times and locations where no scatterometer winds are available. Direct forcing from ERA-interim or an operational global meteorological model results in even more extensive physical drawbacks, but has the advantage of increased temporal coverage. We propose to maintain this increased temporal coverage in a gridded wind and stress product, but also to maintain most beneficial physical qualities of the scatterometer winds, i.e., 25-km spatial resolution, wind-current interaction, variability due to moist convection, etc., and, at the same time avoid the large-scale NWP parameterization and dynamical errors. In fact, collocations of scatterometer and global NWP winds show these physical differences, where the local mean and variability of these differences are rather constant in time and thus could be added to the ERA-interim time record in order to better represent physical interaction processes and avoid NWP model errors. Correction of either the wind vector biases and wind vector variability is expected to affect ocean forcing. Moreover, the collocation process provides NWP winds, but sampled like a scatterometer and, therefore, provides information on the scatterometer wind sampling error.

Prior to merging different scatterometer data sources, a comprehensive characterization of the scatterometer corrections is required. We provide an assessment of the corrections and sampling errors for the tandem scatterometer data set composed by ASCAT-A/B, RapidScat, Oceansat-2 and HY-2A, which, so far offer the most complementary orbits in terms of the diurnal cycle. All comparisons involve the stress-equivalent 10m wind, U10S, which avoids effects of atmospheric stratification and mass density to affect the computed wind differences. U10S may be easily computed from global NWP or moored buoy measurements for comparison to the scatterometer equivalents. U10S, in turn, can be easily related to ocean surface stress.