Exploring similarity between 15 years of satellite SST and SSH using data-driven methods

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Ocean surface current is one of the main oceanographic variables and remote sensing retrieval still need to be improved. To estimate and track these currents, we classically use satellite measurements of Sea Surface Height (SSH), but these data are sparse in space and time, as they are collected along altimeter tracks. Sea Surface Temperature (SST) observations are much more complete in both space and time but the direct relation between SST and surface current is not clear. The covariance of SST and SSH can be exploited to use SST datasets to help fill in the missing information about ocean currents where SSH data are lacking.

Here, we demonstrate the use of a data-driven approach to exploit 15 years of collocated satellite measurements of microwave SST fields and along-track SSH. The idea is to find analog situations on SST fields and artificially create pseudo-observations of along-track SSH from abundant SST. The relation between SST and SSH is tested for different scales, locations and time of the year and the results of this approach are evaluated on turbulent areas at the surface of the ocean.