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Spatial storm statistics

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The classical approach to storm statistics in the ocean is an Eulerian analysis of wave time series at a given location, in which the wave data can be observations or results of wave models. The information obtained from this approach is storm frequency, duration and intensity, from which extremes only at the particular location can be estimated.
The availability of spatial information of wave characteristics at successive time intervals, which is available from large scale hindcast allows the follow-up of storm evolution in space and time. Using this data it is possible to study the spatial evolution of storms, i.e. to provide a Lagrangean description of storm characteristics.
Ships cross the ocean in the routes that are chosen in order to minimize danger and expenses. A safer route will try to avoid high seas and areas with high probability of storms. In the Eulerian approach information about the storm spatial and temporal evolution is not available. In the Lagrangean approach a storm is defined as spatial pulse above the defined threshold z, which is moving over the basin. The area defined by the set of contiguous points is the storm area in any moment. It is possible to obtain the geometrical center of the storm, it square, speed of movement, the maximum significant wave heights (SWH), the coordinates of the maximum SWH values, and some other statistics.

The details of approaches and results for some Seas and N. Atlantic will be presented.