Estimation of the optimal wind factor of drifting objects from field experiments

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Particle tracking models (PTM) are used to calculate the trajectory of drifting objects for search and rescue in case of marine accidents. During marine accidents, the rescue team needs to predict a possible path of the objects in the ocean to implement an effective plan of dealing with the rescue. In this study, we try to improve the accuracy of PTM throughout a series of field experiments. Field experiments were conducted using drift buoys and mannequin with/without life jacket. The drift buoys and mannequin were designed to be easily influenced by wind and current in the sea.

For PTM we used the module embedded on MOHID (Modelo Hidrodinâmico) and the results of WRF (Weather Research Forecasting) and MOHID are used as wind and current input data, respectively. This study aims to find the optimal wind factor according to the objects by using new method to improve the PTM accuracy. In order to estimate an optimal wind factor, we simulated iteratively on the different wind factor from 2 to 5% by increasing 0.2%. However we found the optimal wind factor varies with the wind speed. So, we divided into 16 sections from 2.5 to 10 m/s of wind speed and extracted the best accuracy at each section. Finally we made a formula with wind speed and wind factor. Using this formula, the accuracy of search and rescue was improved by about 10% compared to that in the usual method.