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Wake wash waves produced by High Speed Crafts:measurements vs prediction

Guido Benassai
University of Naples Parthenope, Dept. of Applied Sciences, Centro Direzionale Is. C4, Naples Italy (gbenassai@iol.it)

The subject of this study refers to the wake wash waves generated by High Speed Crafts observed at some distance away (typically one or multiple of ship lengths) from the line of travel of the vessel.
The ratio of the vessel speed divided by the maximum wave celerity in shallow water (depth-based Froude number) or to the square root of the gravity by the vessel length (length-based Froude number) is often used to classify the wash. In fact the wash waves produced by vessels that travel at sub-critical Froude numbers are different in patterns (and hence applicable theory) from that produced by vessels which operate at the critical Froude number of 1 or at supercritical Froude numbers. High Speed Crafts generally operate at Fr>1, even if in some cases for safety of navigation they operate at Fr<1. In the study supercritical speed conditions were considered.
The predicted wake wash was a result of a desk-top study and relied on the subject matter presented in numerous technical papers and publications, while the measured wake wash is a result of the first field measurements of wake wash produced by HSC operating in the Bay of Naples. The measurements were operated by a pressure gauge in three critical points where the distance from the coastline was less than 700m. These measurements were taken in shallow water (depth ranging from 4 to 5 meters) in calm weather conditions. The output of the tests were wave-elevation time histories upon which the maximum wave height Hm from the wave record was extracted. The wave height reported was therefore the highest wave, peak to through, which occurred in a wave train. The wave period is defined as double the related half period for the defined maximum wave height.
For each wake wash measurement the vessel route was monitored aboard the crossing HSC and exact speed, distance and water obtained depth was determined. The obtained values of the wake wash were compared with predictions of wake wash obtained by similar vessels in analogous speed and depth conditions. Finally some comments and conclusions were given about the accordance between the measurements and the predictions of wake wash waves.