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Cruising performance of ships with large superstructures in heavy sea —1st report: Added resistance induced by wind—

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Summary: From economical and safety aspects the assessment of steady-state cruising performance of ships under heavy wind loading is very important. A large passenger ship and a PCC with a very large hull and superstructures above sea level, which are greatly affected by wind, are treated in this paper. The assessment of the ship performance is conducted using a computational calculation method. The steady-state equations are formulated based on the MMG model for ship manoeuvring simulation to obtain the steady ship conditions like drift, heel and rudder angles. The wind loads on those ships used in the calculation, including the effect of boundary layer profiles of wind and the heel effect of the ships, are estimated by the method that the authors proposed. As a result, some important characteristics of the resistance increase in steady running condition in heavy wind for the ships are clearly revealed.

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