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Simulations of Slewing Motion of a Towed Ship

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Summary: A simulation method for the maneuvering motion of a towed ship in still water is presented. A 2D lumped mass method is employed for expressing the dynamics of the towing cable. The motion equations of the towed ship and the cable are derived under the assumption that the motions are defined in the horizontal plane. Motion of a towing ship is assumed to be given. As a calculation example, a towing barge with/without skegs is selected. The captive model test is carried out to capture the hydrodynamic force characteristics of the barge. Using the force characteristics, simulations are made for various towing speeds, towing cable lengths and so on. The calculated results are compared with the model test results conducted in the towing tank. The results of the slewing motion frequency, changes of heading angle and yaw rate in time domain agree well with the experiments. The present method is useful for predicting the slewing motion of towed ship.

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