OPTIMAL ESTIMATION OF THE PARAMETERS FOR SHIP NAVIGATION

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Abstract: This paper considers the optimal estimation of a ship's navigation parameters as a nonlinear stochastic state estimation problem. For the design of the selected estimation methods: the extended Kalman filter and decoupled Kalman filter, an extended maneuvering ship mathematical model was used. Compensation of the effects in position measurement was achieved using appropriate models of roll and pitch, based on the suitable second-order shaping filters. Performance evaluation of selected algorithm with respect to estimation errors and computational requirements was accomplished for the case of representative ship maneuver and for different sensor configurations. For practical realization, a unique form of decoupled navigation estimator, proposed by the authors, is shown to be a good compromise between estimation accuracy and realization complexity.

REFERENCES
