

Accurate Evaluation for Low-Carbon Shipping Using Wave Hindcast Database

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ABSTRACT

Voyage evaluation analysis requires actual data on voyage and external forces (i.e., meteorological and oceanographic). Although voyage data, often referred to as noon data, were previously collected once a day, monitoring systems have gradually become popular in recent years, and data is collected at small sampling intervals. In contrast, winds are generally observed as meteorological and oceanographic data by onboard anemometers; however, it may include observation errors. Although waves are also crucial while considering the impact on ships, onboard wave observations are currently difficult. Therefore, the use of hindcast data, which are re-analysed oceanographic values and are considered to be the most probable, is gradually increasing due to its high accuracy. A comparative verification was performed in this study based on different sampling intervals of voyage data and different types and elements of oceanographic data to confirm the possible sea conditions that a ship would encounter on an actual voyage and obtain estimated ship performance curves using wind and waves. The results confirmed the importance of the sampling interval of voyage data, the possibility that hindcast data can accurately reproduce sea conditions encountered by ships, and the effectiveness of wave hindcast data in creating speed–power chart and ship performance curves.

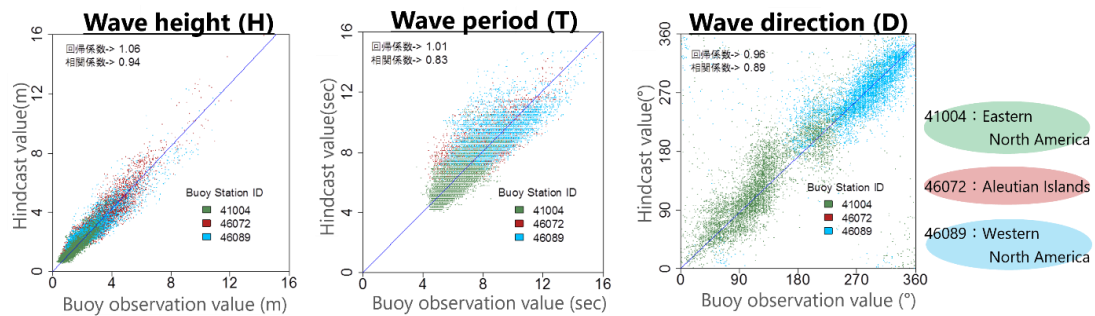
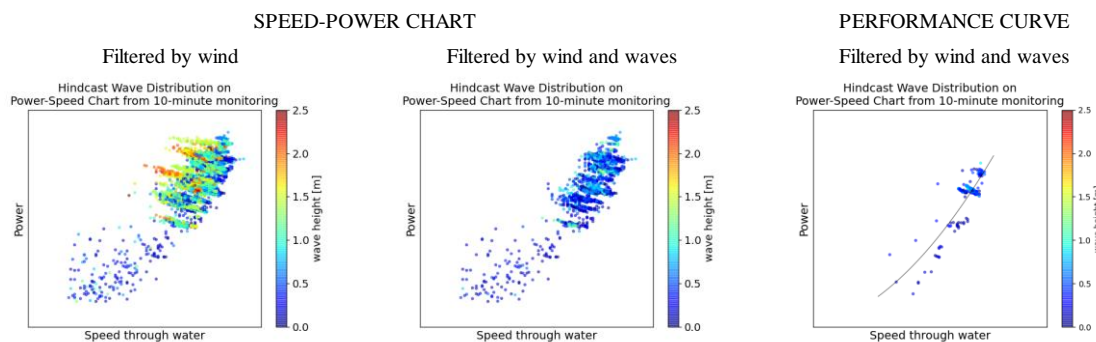


Figure 1. Example of the accuracy verification of hindcast data



Tables 2. Example of speed–power charts and performance curve

REFERENCES

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