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## **Abstract**

The wind stress is generally expressed using the drag coefficient  $C_D$  with the wind speed at a height of 10 m above the sea surface,  $U_{10}$ . However, there is considerable disagreement in the observed values of  $C_D$ . To develop a model of  $C_D$ , measurements of wind stress are necessary, and the wind stress needs to be calculated using the eddy-correlation method, which measures the horizontal and vertical wind components. The wind stress measurement is limited to fixed installations due to the effect of the platform on the wind flow. Therefore, a numerical simulation is a better method to select installation locations where the wind stress can be measured with high precision, by excluding the effect of the platform. As the first approach, we investigated the application of numerical simulations to high-precision observations of flow around the Hiratsuka observation tower of the University of Tokyo using CFD (Computational Fluid Dynamics). We found that the wind velocity obtained by the numerical simulations tended to be similar to the measured wind speed values. In addition, the flow visualization showed the effect of the observation tower on the wind flow. As a result, the ratio of the effect of the Hiratsuka Tower has ranges of 5%–10% for heights of 4.1 m–2.2 m, from the center of the top of the tower. Therefore, numerical simulations have an ability to determinate the position of the high-precision observations in the wind stress measurements.