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PRESS RELEASE (2023/06/09)

The Research and Education Center for Offshore Wind Selected for "NEDO Feasibility Study Program / Feasibility Study Program on New Technology (Feasibility Study Program on Energy and New Environmental Technology)"

Associate Professor Takanori Uchida (Principal Investigator) of the Renewable Energy Center, Research Institute for Applied Mechanics (RIAM), and Professor Kenji Ono of the Research Institute for Information Technology, both of whom belong to the Department of Multiscale Offshore Wind Environment Research, Research and Education Center for Offshore Wind, have been selected for "FY2023 NEDO Feasibility Study Program / Feasibility Study Program on New Technology (Feasibility Study Program on Energy and New Environmental Technology)" commissioned by the New Energy and Industrial Technology Development Organization (NEDO), together with Toshiba Energy Systems & Solutions Corporation, Hitachi Zosen Corporation, and NSK Ltd. The research and development theme is "Research and development of evaluation technology for the wake phenomena of floating wind turbines using large-scale wind tunnel facilities."

Generally, a wind speed defect area called a wind turbine wake is formed on the downstream-side of a wind turbine blade as it rotates. In a large-scale offshore wind farm consisting of multiple wind turbine groups, wind turbine wakes interfere with each other, causing direct impacts on downstream wind turbine groups, including lowering their power output and increasing their wind load. Evaluation methods that accurately describe these nonlinear flow phenomena have not yet been established.

The Japanese government has set a goal of achieving carbon neutrality by 2050, and offshore wind power generation is expected to be one of the key technologies to achieving this goal. Under these circumstances, in order to quickly and appropriately realize large-scale offshore wind farms in Japan, the most important task is to establish Japan's original innovative and optimal design method for offshore wind farms, including high-precision prediction of wind turbine wake phenomena that contributes to better evaluation of bankability and cost reduction.

In this research, we will work on gaining an accurate understanding of the wake phenomena particular to floating wind turbines and their mutual interference phenomena and on the development of prediction evaluation technology for them through industry-academia collaboration, using the large-scale wind tunnel facilities of RIAM, Kyushu University. Through this research, we aim to propose the necessary future technology development policy. There are almost no examples in the world of evaluation methods for floating wind turbine wakes based on large-scale wind tunnel facilities. This research is expected to gradually solve the technical problems of large-scale floating offshore wind farms and make a great contribution to the expansion of their introduction. At the same time, the latest research results will be provided mainly to Europe and the United States through IEA Wind Task 44 (Wind Farm Flow Control).

Kyushu University will contribute to the prevention of global warming through industry-academia collaboration schemes.

Associate Professor Takanori Uchida
(Principal Investigator)

Visualization example of wind turbine wake phenomena using large wind tunnel facilities

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Driving social change with integrative knowledge

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