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A coupled wave-atmosphere model for offshore weather forecasting

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High quality wave and wind forecasts are crucial for the offshore industry and offshore wind parks. To better describe the state of the ocean and lower atmosphere, a coupled wave-atmosphere model has been developed. The model system consists of the atmospheric model WRF, the wave model SWAN, and the ESMF model coupling framework. In addition, the wave model use boundary conditions from an external wave model, to provide a better description of swell systems originating outside the model region. The overall aim of the system is to improve the forecast quality of ocean waves and wind in the North Sea.

The model system will be presented, as well as preliminary results. Different approaches for coupling the models are also explored, such as the frequency of wave-atmosphere exchanges, and the parameterization of the surface roughness and its effect on the wind profile in the atmosphere model.