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Satellite ocean surface winds in offshore wind engineering

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Satellite ocean surface winds from several sensors are analyzed in respect to offshore wind engineering needs. The long-term ocean wind time-series from passive microwave (SSM/I) have been compared with wind power production, wind observations on land and modelled winds during an 18-year period. The most interesting finding is that the wind-indexing shows systematic variations between land and sea winds. This is in particular relevant for the prediction of offshore wind power. For wind resource mapping a comparison of the Northern European offshore winds and winds in the trade wind belt (Cape Verde) is made based on satellite scatterometer (QuikSCAT) ocean winds. For both regions the land-based wind roses compare well to the 7-year results from satellite. The advantage of satellite SAR wind maps is the high spatial detail, and examples from the Northern European seas are given. The Envisat ASAR data are a most promising source of information for detailed coastal offshore wind resource mapping. Results from the Danish Seas will be presented.