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SAT-WIND: Mapping the offshore wind resources near Denmark using satellite observations

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Research is conducted on mapping the Danish offshore wind resource. The SAT-WIND project investigates all available data sources that provide offshore wind fields. This includes wind speed maps from passive microwave (SSM/I) and wind vector maps from scatterometer (ERS, NSCAT, QuikSCAT, MIDORI-2) and polarimetric microwave (WindSat) at grid resolution 25 km by 25 km. Wind speed from altimeter at 50 km by 50 km resolution is also included. Furthermore wind vector maps based on Synthetic Aperture Radar (SAR) from ERS-2 and Envisat are investigated. The grid resolution is from 400 m by 400 m to $\sim$ 2 km by 2 km using SAR observations. The highest spatial detail is available from SAR covering the coastal zone (3 to 50 km offshore) where the offshore wind farms are constructed and new wind farms are planned. The Envisat ASAR Wide Swath Mode images allow large parts (400 km by 400 km) of the Danish interior seas to be mapped instantaneously at medium resolution. The most frequent coverage of ocean winds is provided by the low-resolution satellite data and temporal variations are quantified based on these. The results will be compared to wind observations and model results. The SAT-WIND project is funded by the Danish Research Agency (Sagsnr. 2058-03-0006) and the satellite images were provided by the ESA project EO-1356.