

Introduction

- The long-term average wind climate offshore is essential for wind energy planning in the marine environment, where in situ measurements are costly and sparse.
- DTU Wind Energy has a long-standing tradition of utilising Scatterometer and Synthetic Aperture Radar (SAR) ocean surface winds to cover the needs of offshore wind energy applications, e.g Karagali et al. [1], Hasager et al. [2].
- Scatterometer winds from ASCAT, with their extended period of availability are valuable for describing longer-term wind statistics for offshore areas.
- SAR winds are being retrieved since the ENVISAT era and with the addition of Sentinel-1, a large archive of high-resolution surface wind fields is publicly available at <https://satwinds.windenergy.dtu.dk/>.
- Example products for wind resource assessment are available at <http://science.globalwindatlas.info/science.html>

Scatterometer and SAR Winds at DTU Wind Energy

ASCAT

- EUMETSAT C-band scatterometer
- Stress Equivalent Winds
- 12.5 km Coastal product
- 2007 - now
- From Copernicus & O&SI SAF
- Wind speed & wind direction
- Extrapolation to wind turbine levels following Badger et al. [4].

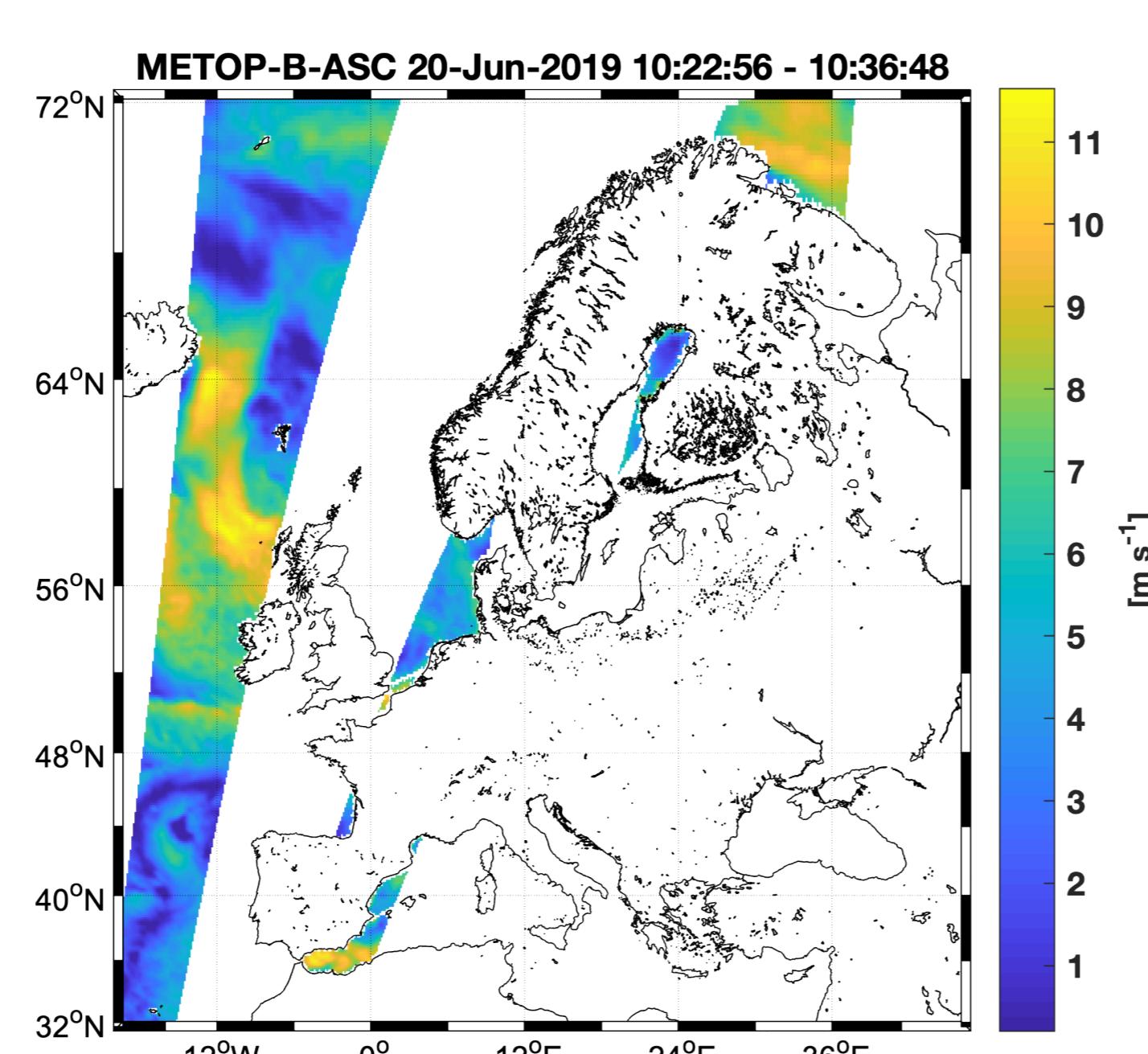


Figure: METOP-B ASCAT winds over Europe retrieved on June 20, 2019.

SAR

- ESA C-band Synthetic Aperture Radar
- ENVISAT ASAR & Sentinel-1 A/B
- 2002 - 2012 & 2015 - now
- From Copernicus
- Wind retrievals at DTU Wind Energy (SAROPS)
- Inter-calibration, Badger et al. [3]
- GFS input wind direction
- Extrapolation, Badger et al. [4]

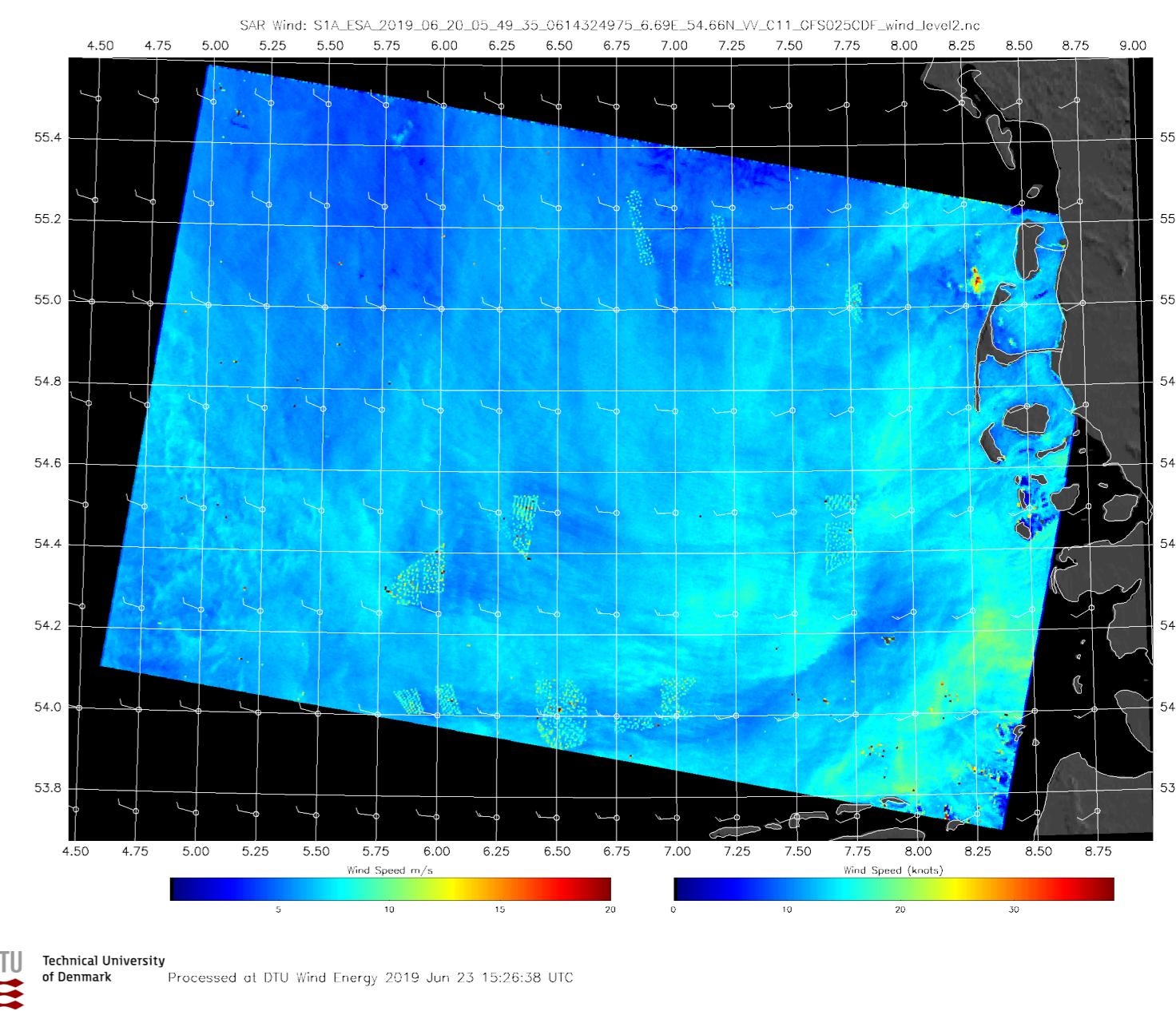


Figure: Sentinel-1 A winds over the south-east North Sea on June 20, 2019.

New European Wind Atlas: Mapping Wind Resources Offshore

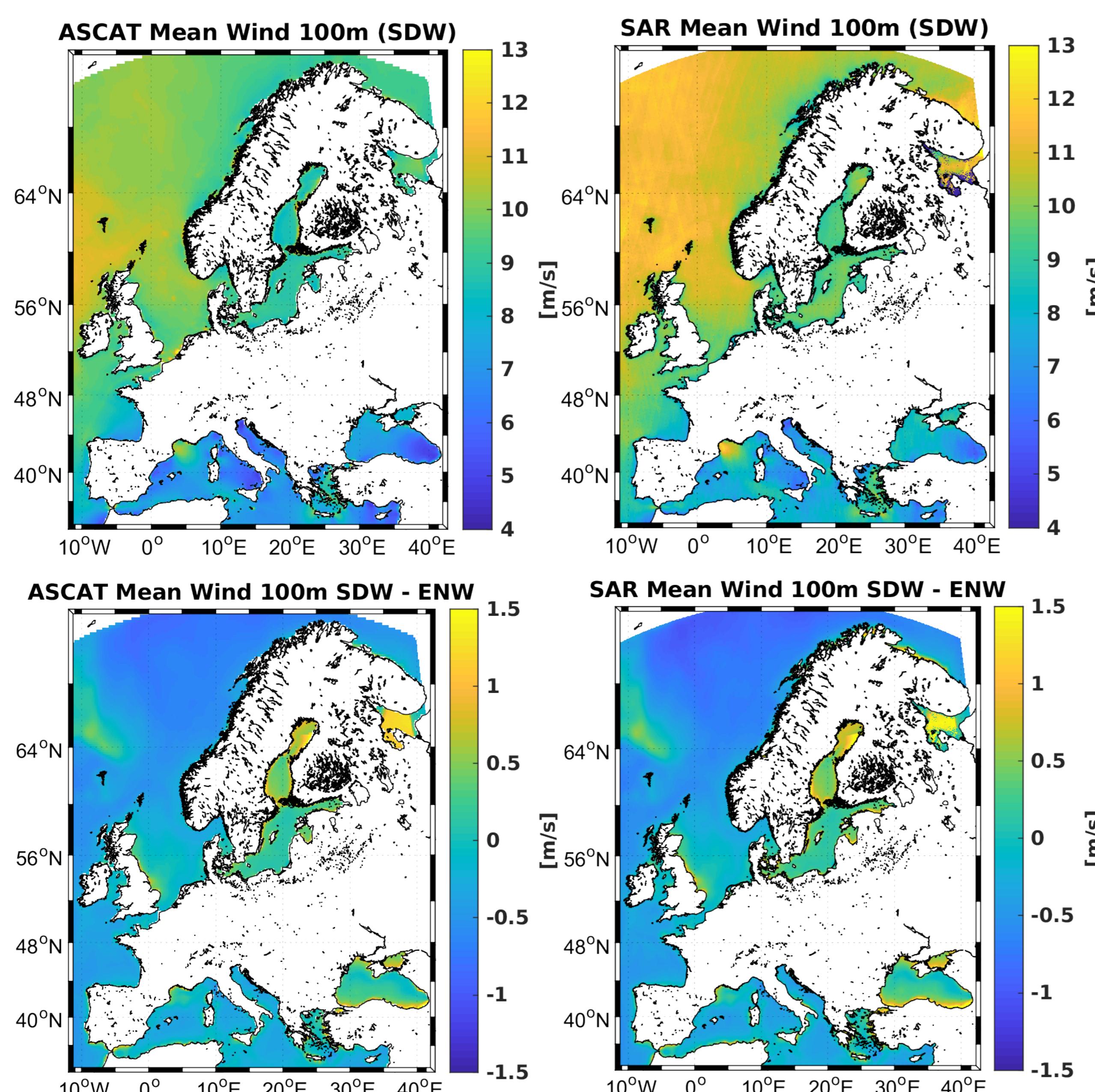


Figure: Top: Mean wind at 100 m from ASCAT (left) and SAR (right). Bottom: Difference in 100 m mean wind between Stability and Neutral Winds [2].

References

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Diurnal variability of Sea Surface Temperature

