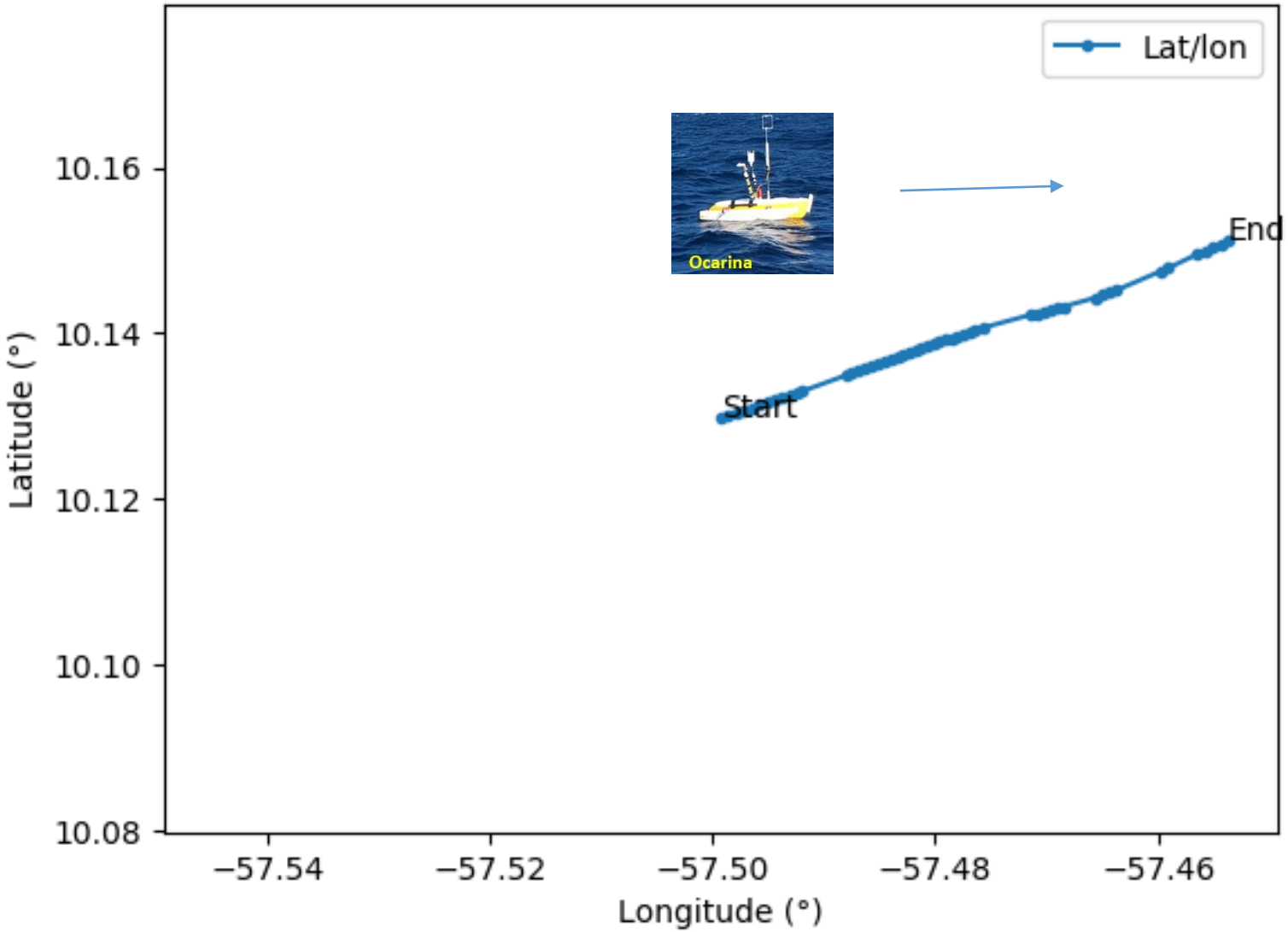
EUREC4A-OA ATALANTE OCARINA

OCARINA

Denis Bourras, Christopher Luneau, Hubert Branger

January 25 2020

GPS Track

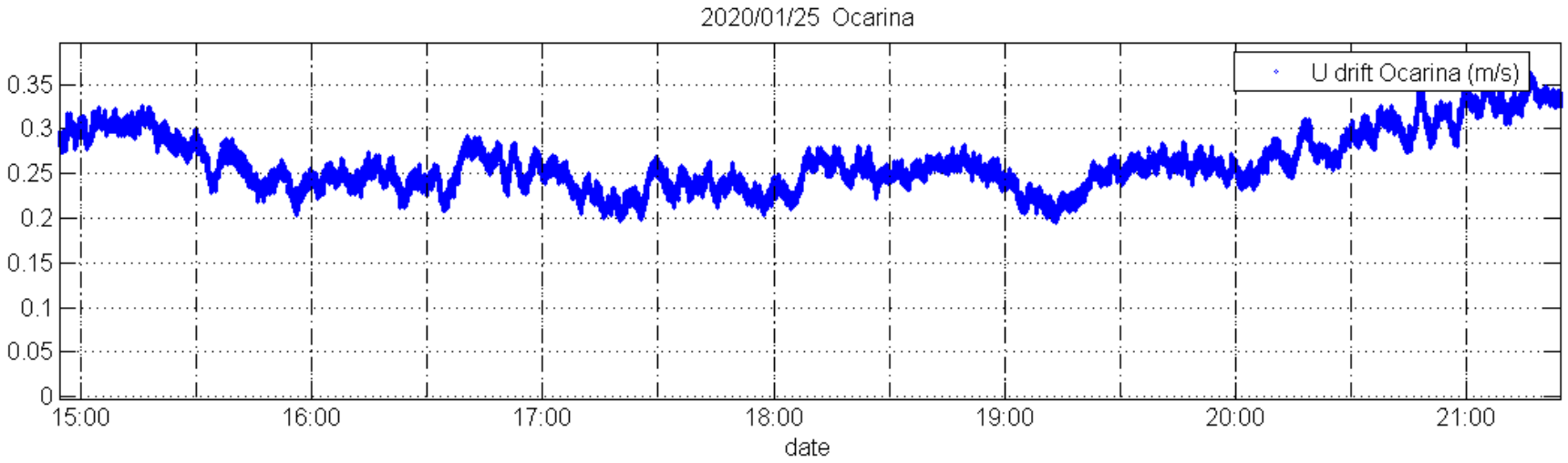


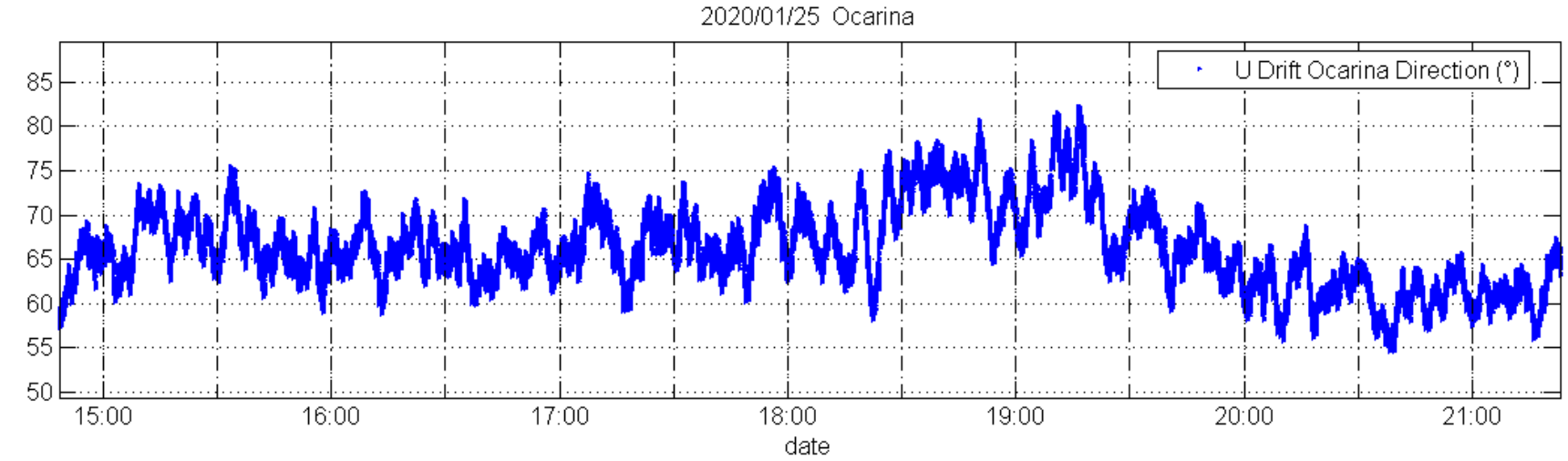
EUREC4A-OA ATALANTE OCARINA

January 25 2020

Measured

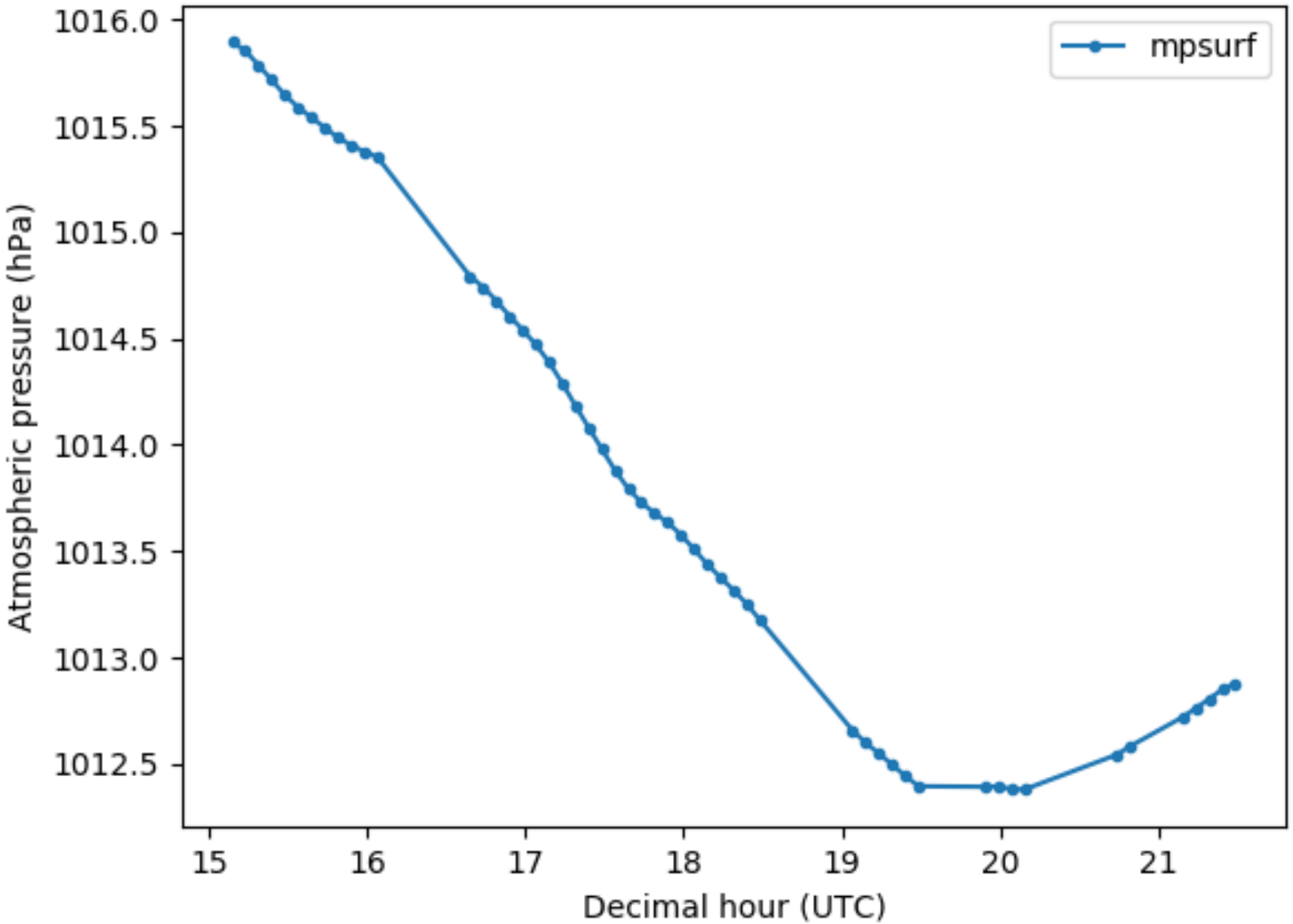
Drift surface of Ocarina





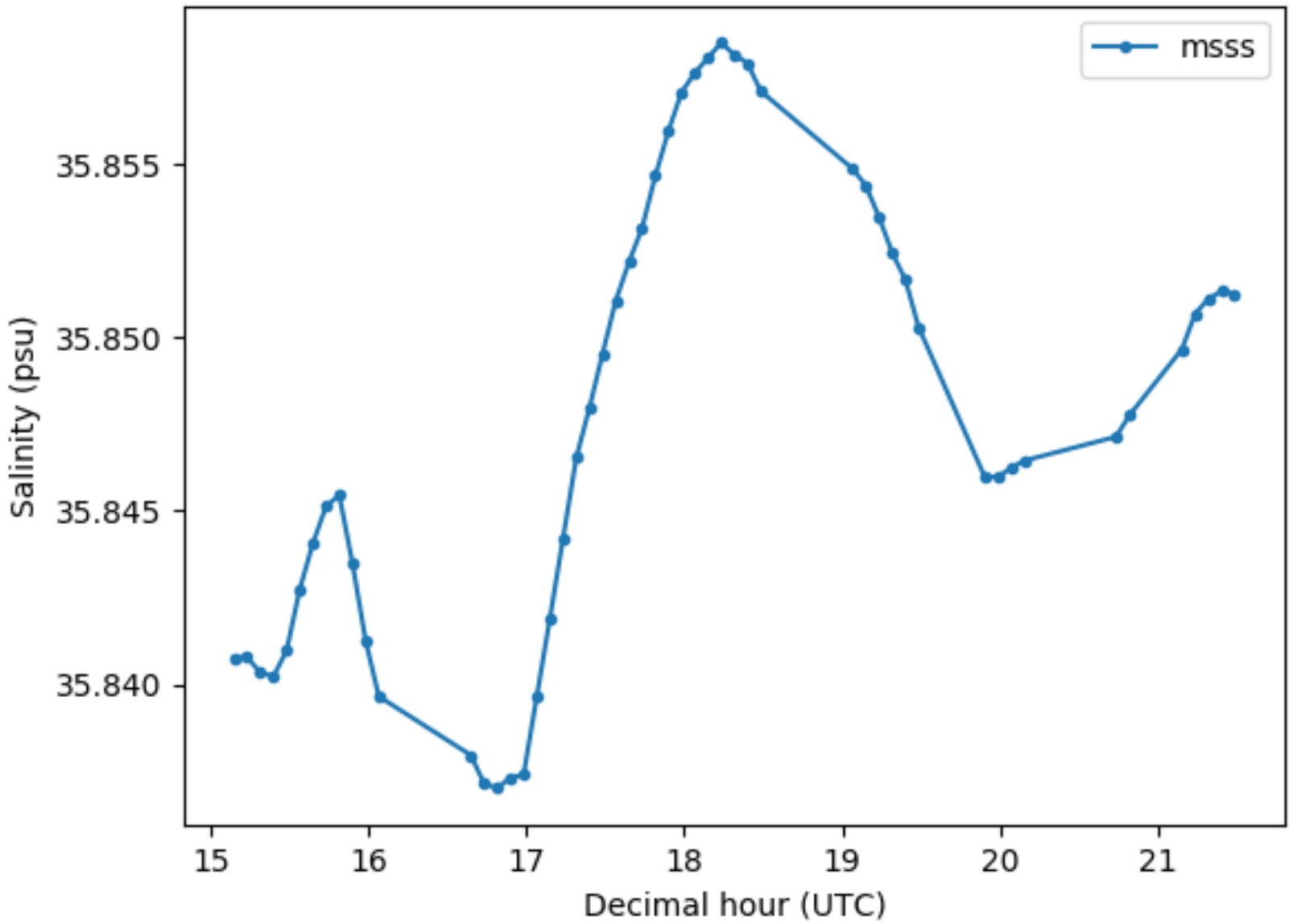
EUREC4A-OA ATALANTE OCARINA
January 25 2020

Measured
Atmospheric Pressure
at sea surface z=0



EUREC4A-OA ATALANTE OCARINA
January 25 2020

Measured Salinity

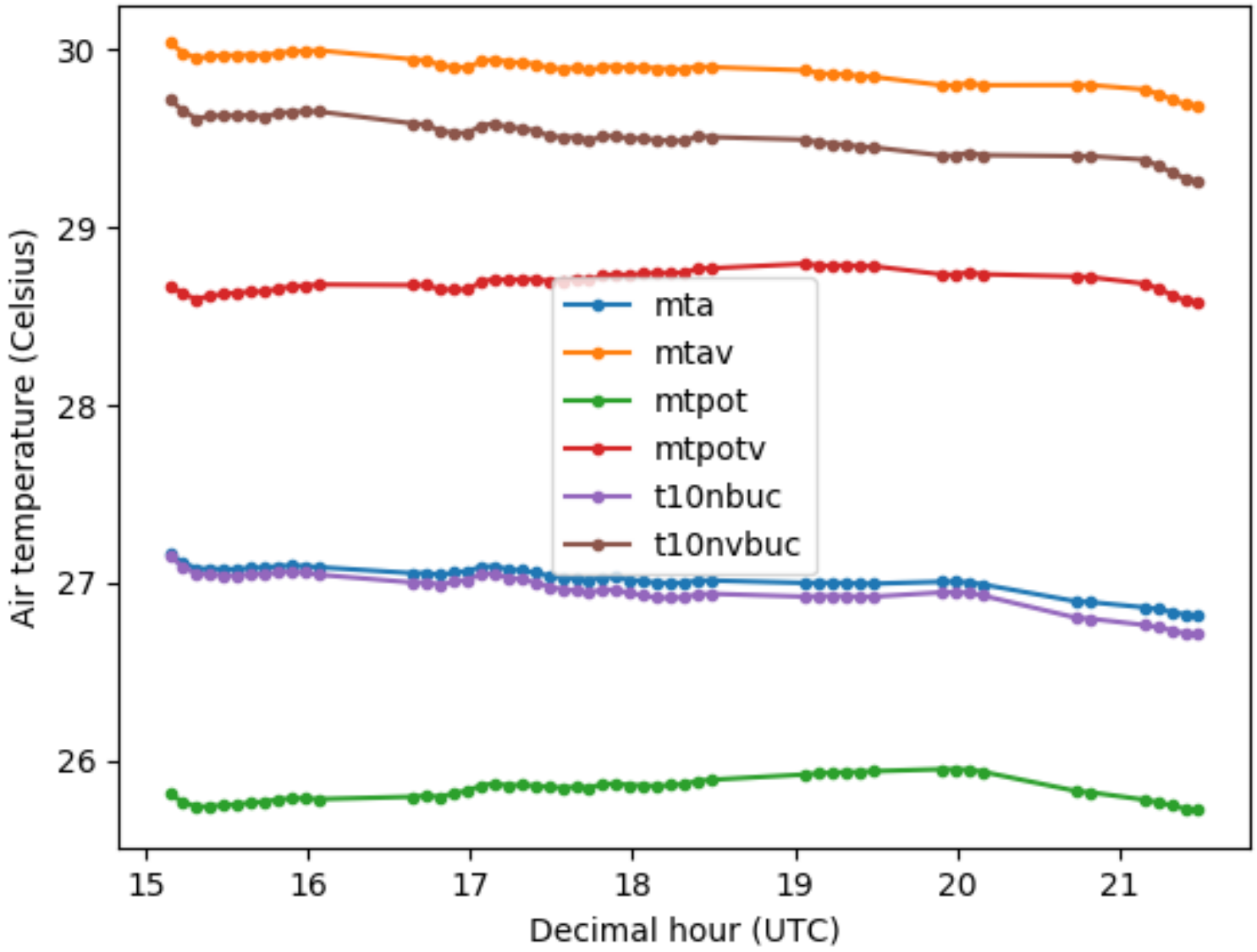


EUREC4A-OA ATALANTE OCARINA
January 25 2020

Measured Air temperature

Measured Tair
Measured Virtual Tair
Measured Potential Tair
Measured Potential Virtual Tair

Estimated if we were in neutral condition (Tair=Twater)
at z=10m
Tair by Buk
Vitual Tair by Bulk

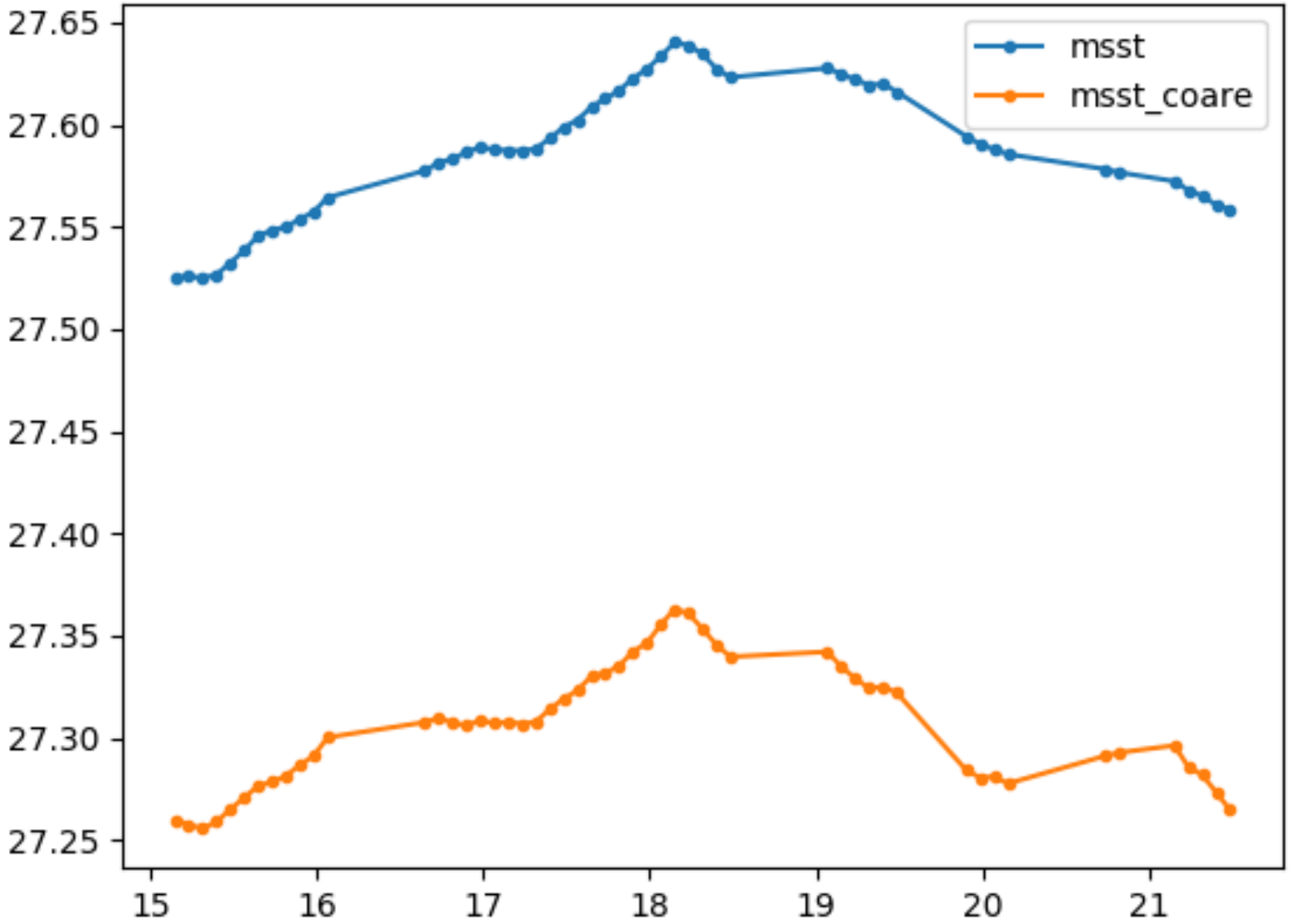


EUREC4A-OA ATALANTE OCARINA
January 25 2020

SST:
Sea Surface Temperature

Measured at z=-0.2m

And estimated at the surface z=0.0m with Coare algorithm (cooler due to evaporation, etc…)

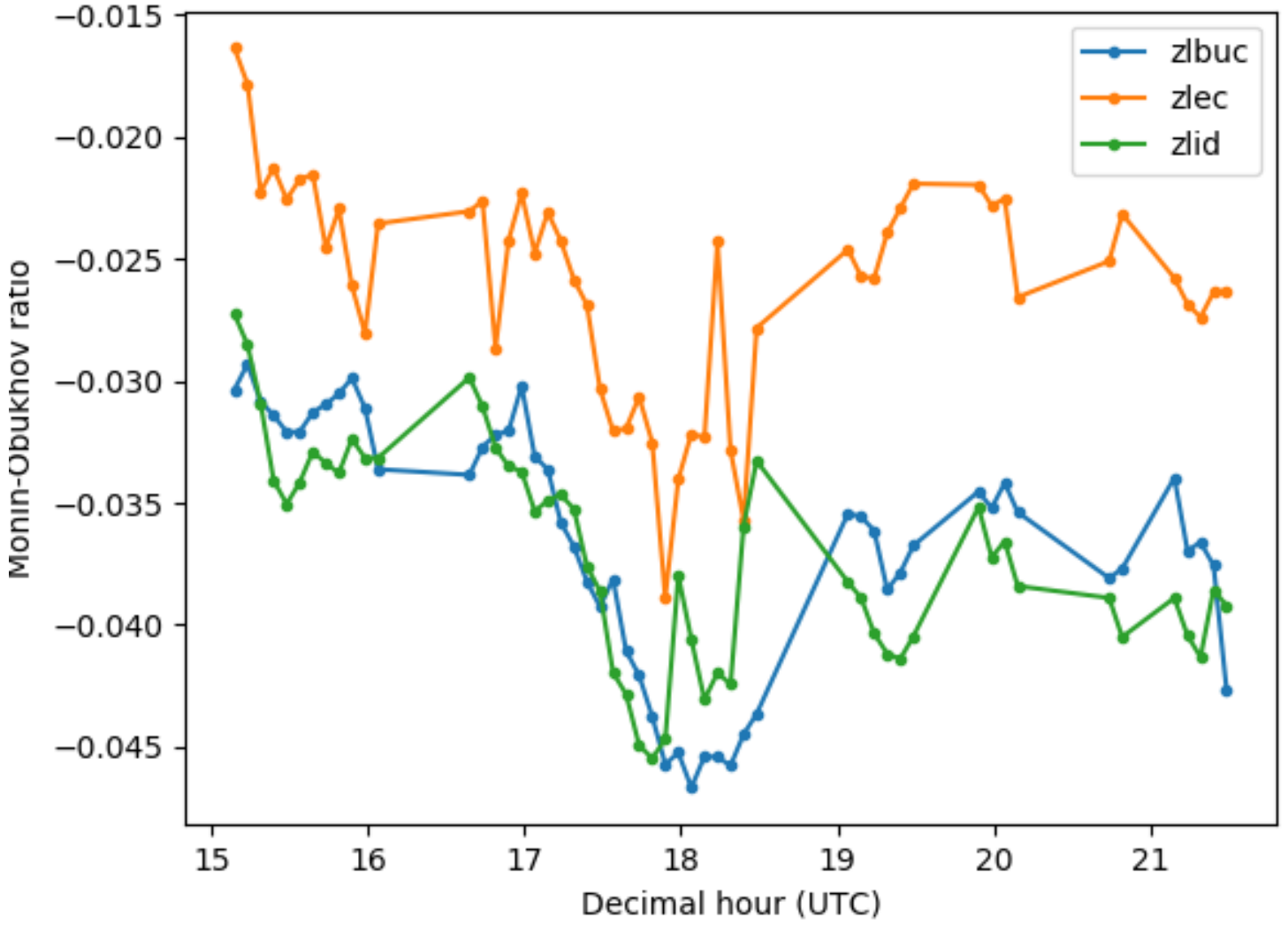


EUREC4A-OA ATALANTE OCARINA
January 25 2020

z/L :
Monin-Obukhov Ratio
Air-Sea stability
(characterize the stability of the marine atmospheric boundery layer)

Estimated with three methods

Bulk
Eddy Correlation
Inertio Dissipative



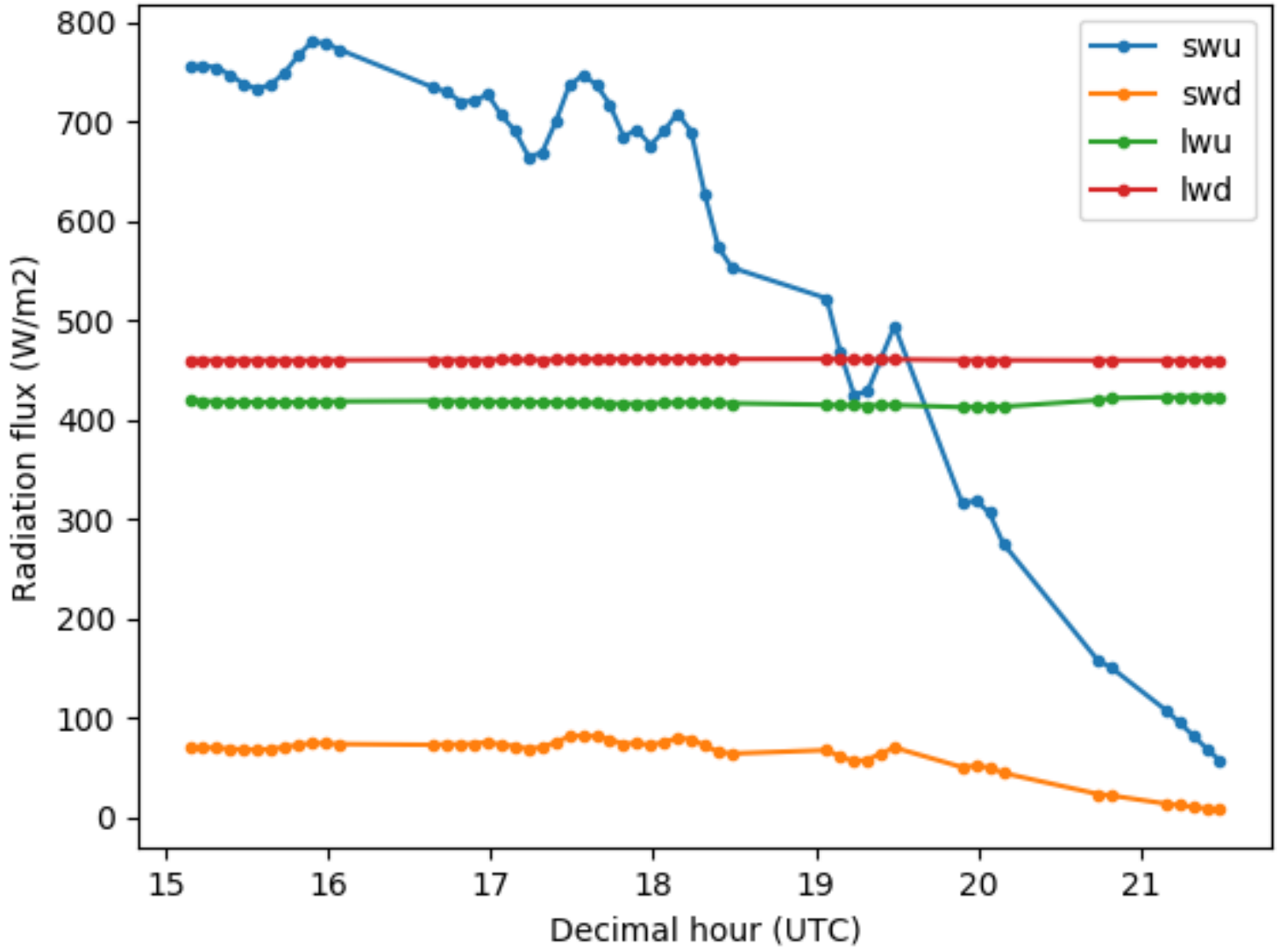
z/L negative means atmospheric instability $\frac{z}{L} = -\kappa\, z \left(\frac{g}{\overline{\theta_V}}\right)\left(\frac{\overline{w\prime\theta\prime_V}}{u*^3}\right)$, with $\theta_V = \theta\,(1 + 0.61q)$, the virtual potential temperature

EUREC4A-OA ATALANTE OCARINA
January 25 2020

Measured Radiative fluxes

Short Wave swu=from sun
Short Wave swd=reflected from water

Long wave (IR) lwu= from sun
Long wave (IR) lwd= from water

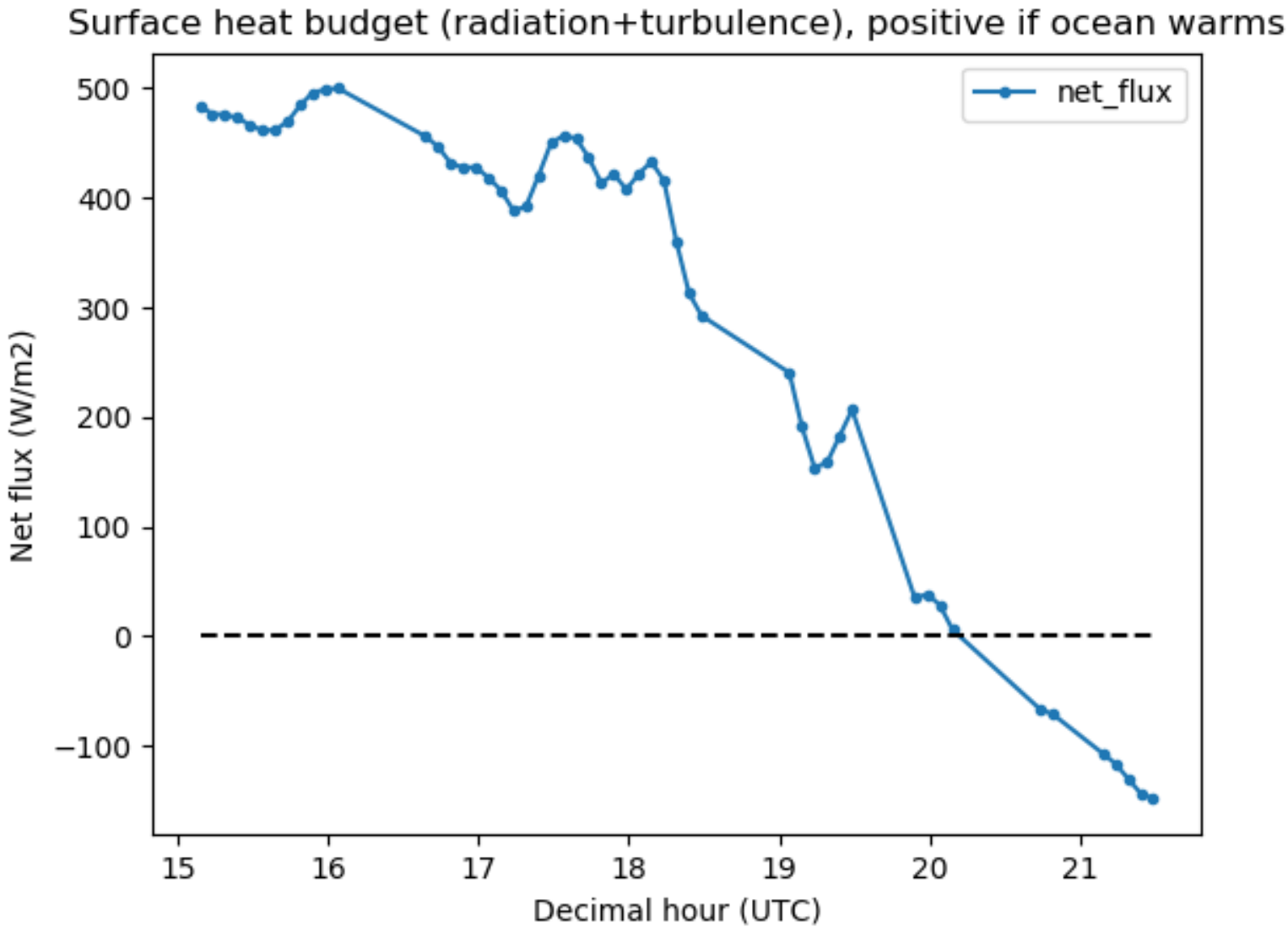


EUREC4A-OA ATALANTE OCARINA
January 25 2020

Measured Radiative fluxes :

Net Flux

(sum of all radiative fluxes)

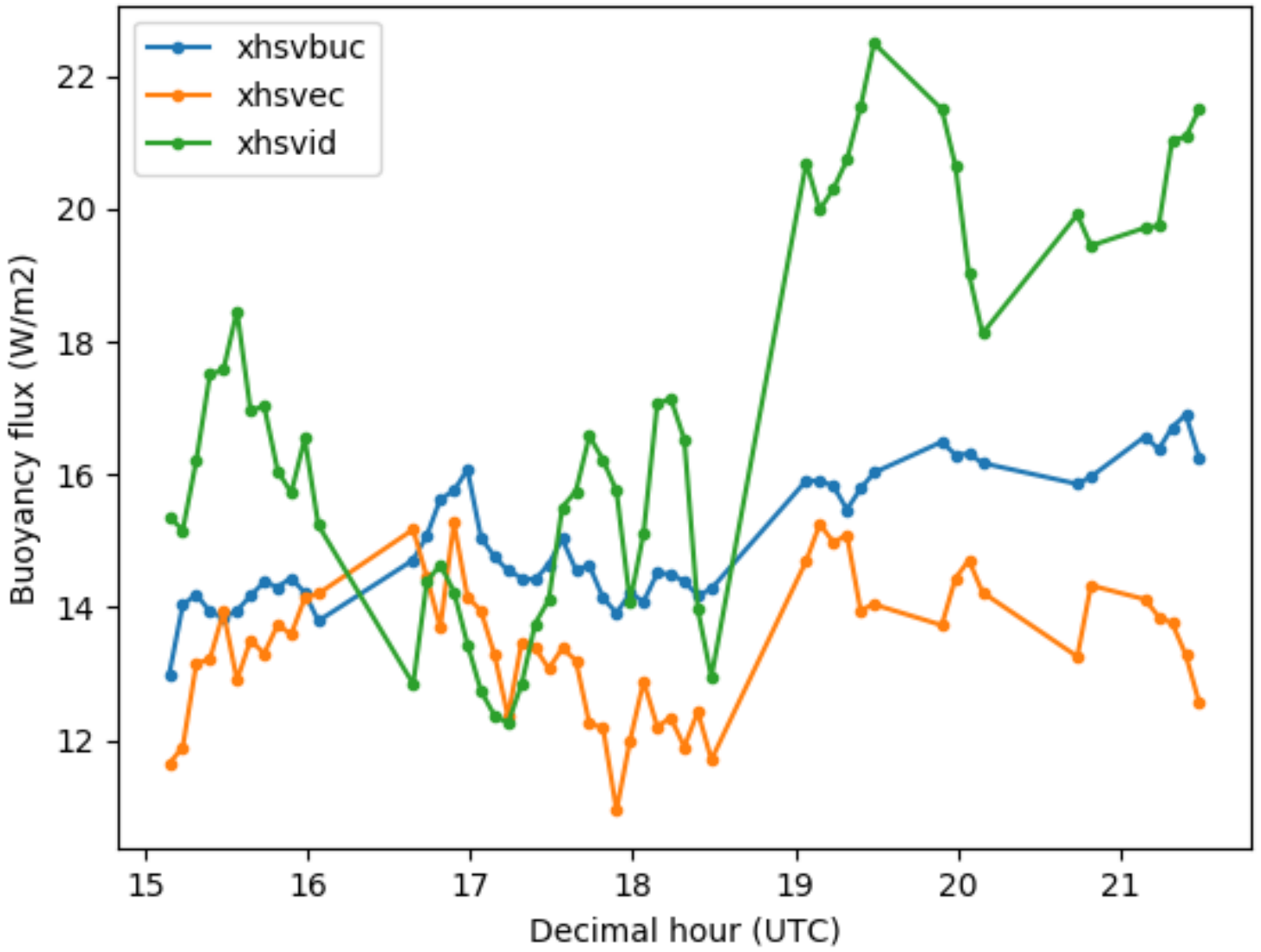


EUREC4A-OA ATALANTE OCARINA
January 25 2020

Buoyancy fluxes

(Sensible heat)

Three methods
Bulk
Eddy correlation,
Inertio Dissipative

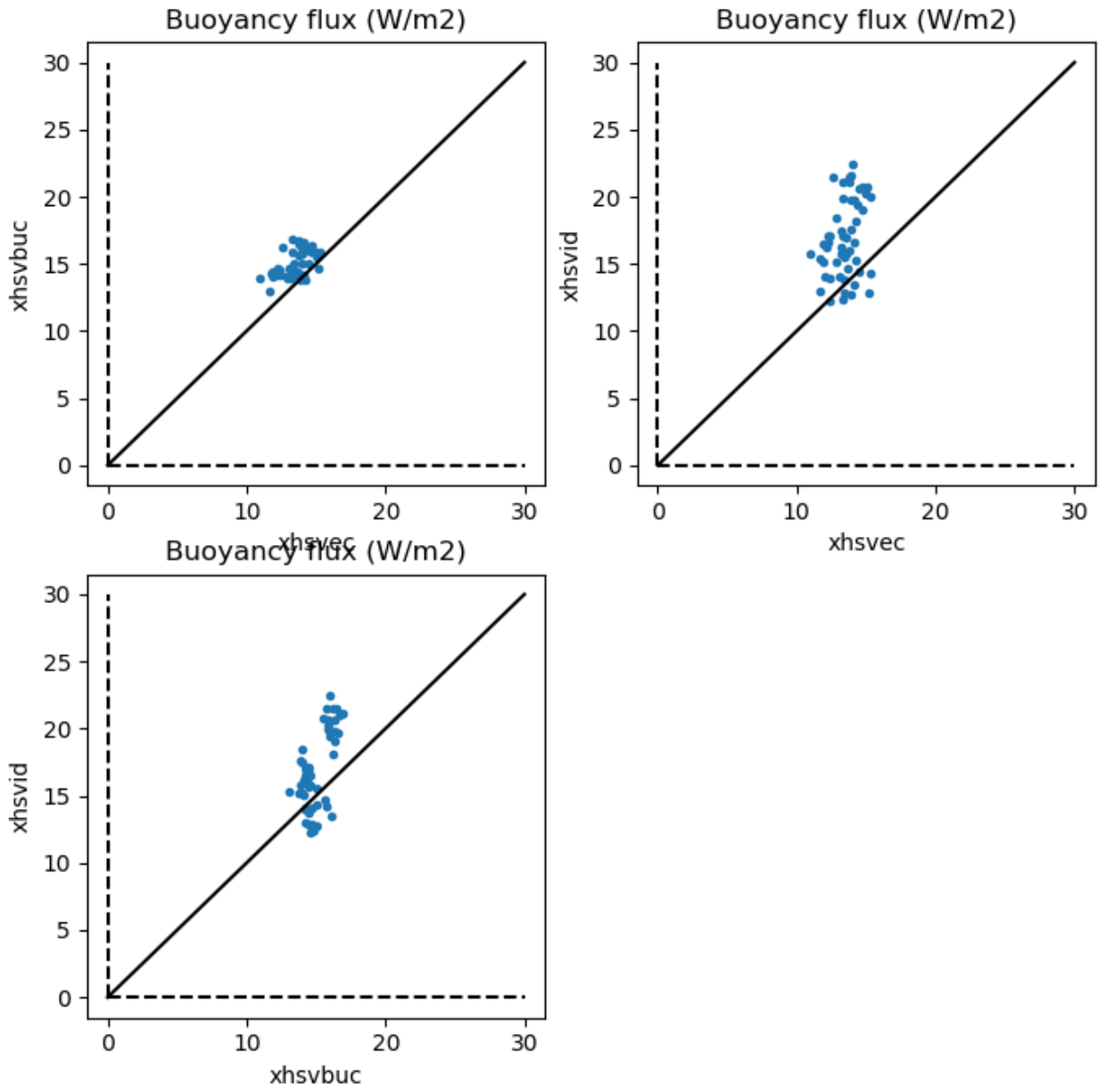


EUREC4A-OA ATALANTE OCARINA
January 25 2020

Buoyancy fluxes

(Sensible heat)

Comparison of three methods
Bulk
Eddy correlation,
Inertio Dissipative

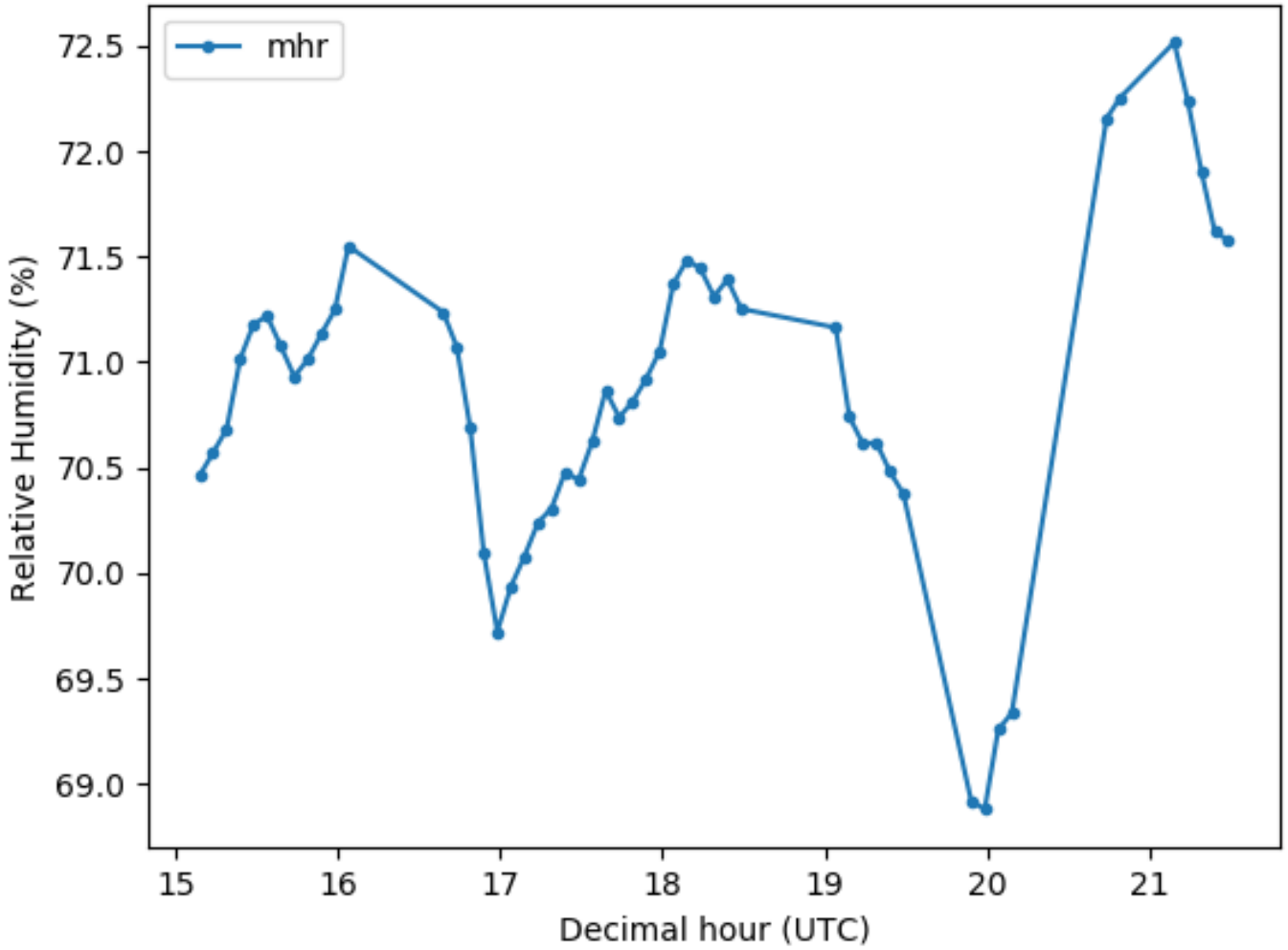


EUREC4A-OA ATALANTE OCARINA
January 25 2020

Measured Relative Humidity

qrel (%)

measured at z=1m

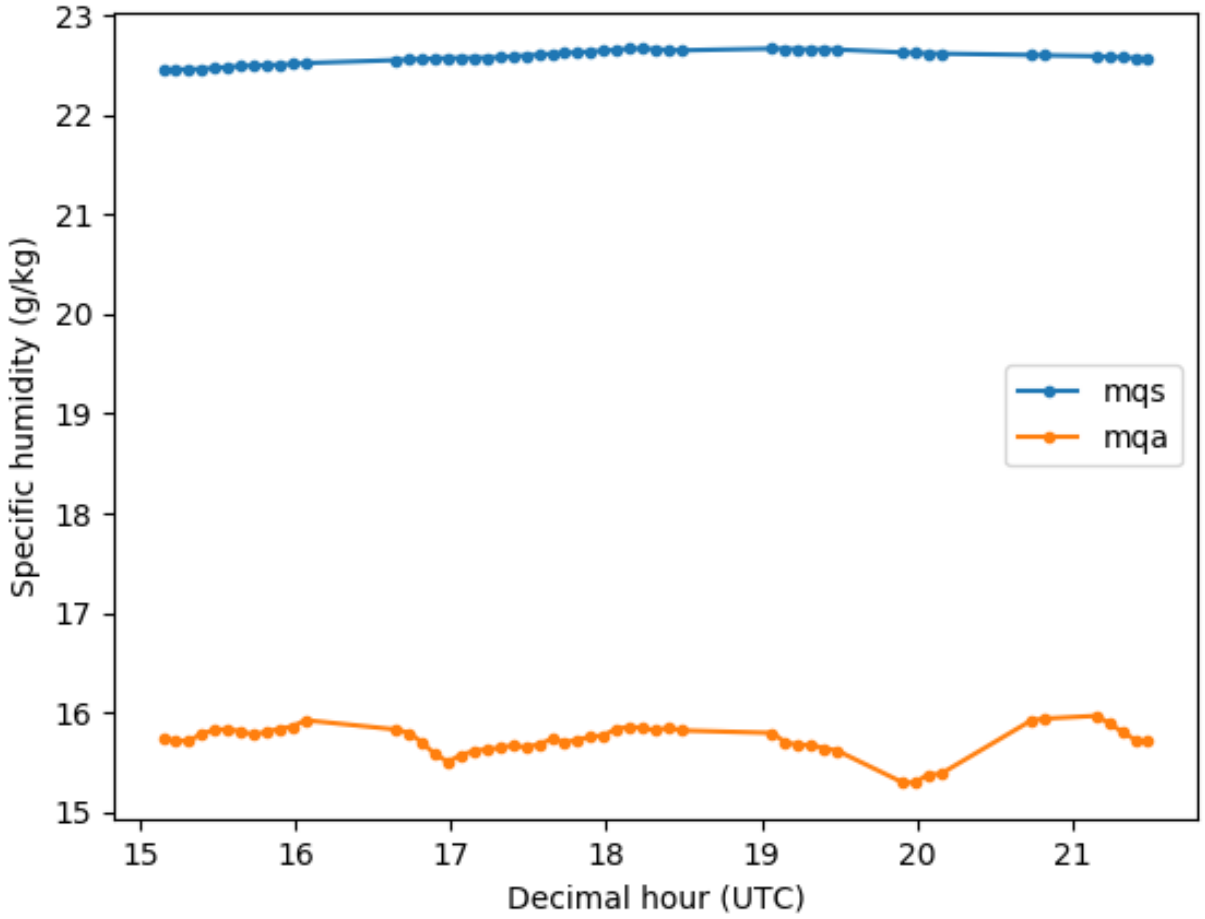


EUREC4A-OA ATALANTE OCARINA
January 25 2020

Measured Specific humidity

mqa (g/kg) measured at z=1m

mqs (g/kg) estimated at sea surface

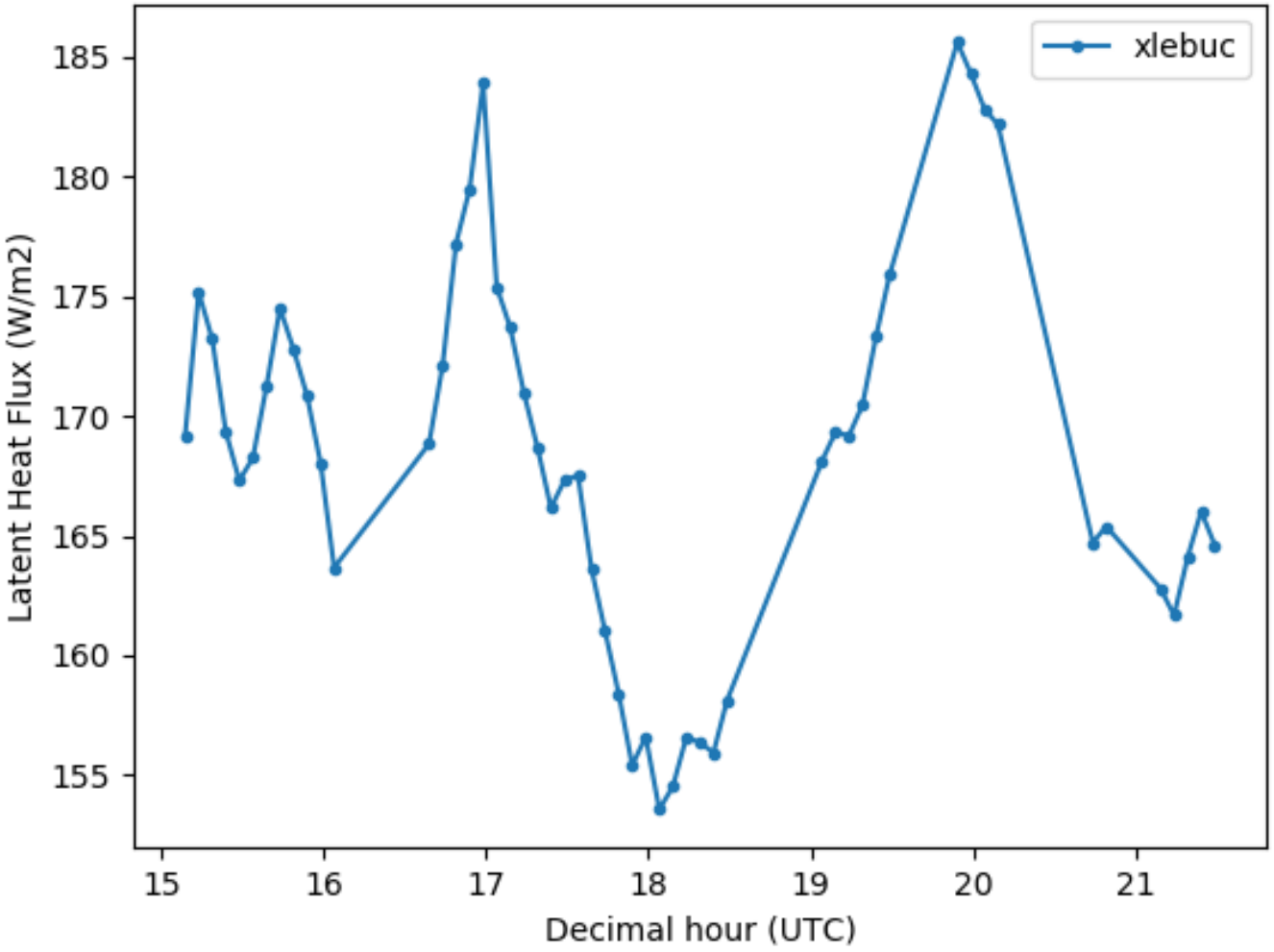


EUREC4A-OA ATALANTE OCARINA
January 25 2020

Latent fluxes

(due to sea surface evaporation)

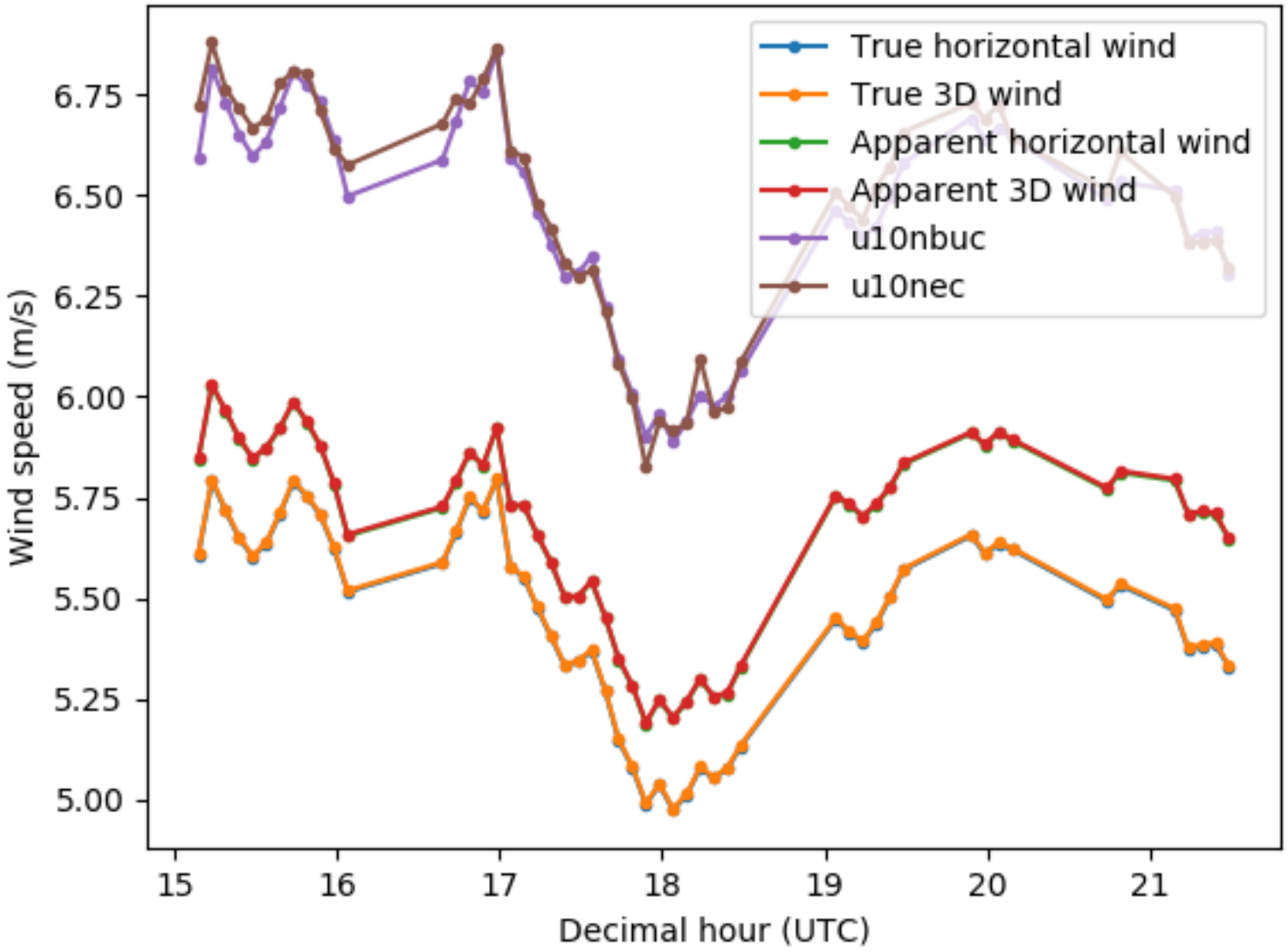
One method
Bulk



EUREC4A-OA ATALANTE OCARINA
January 25 2020

Measured Wind speed

U True wind speed at z ocarina,
U Apparent wind speed at z ocarina
U estimated at z=10 m using different methods
Bulk
Eddy Correlation



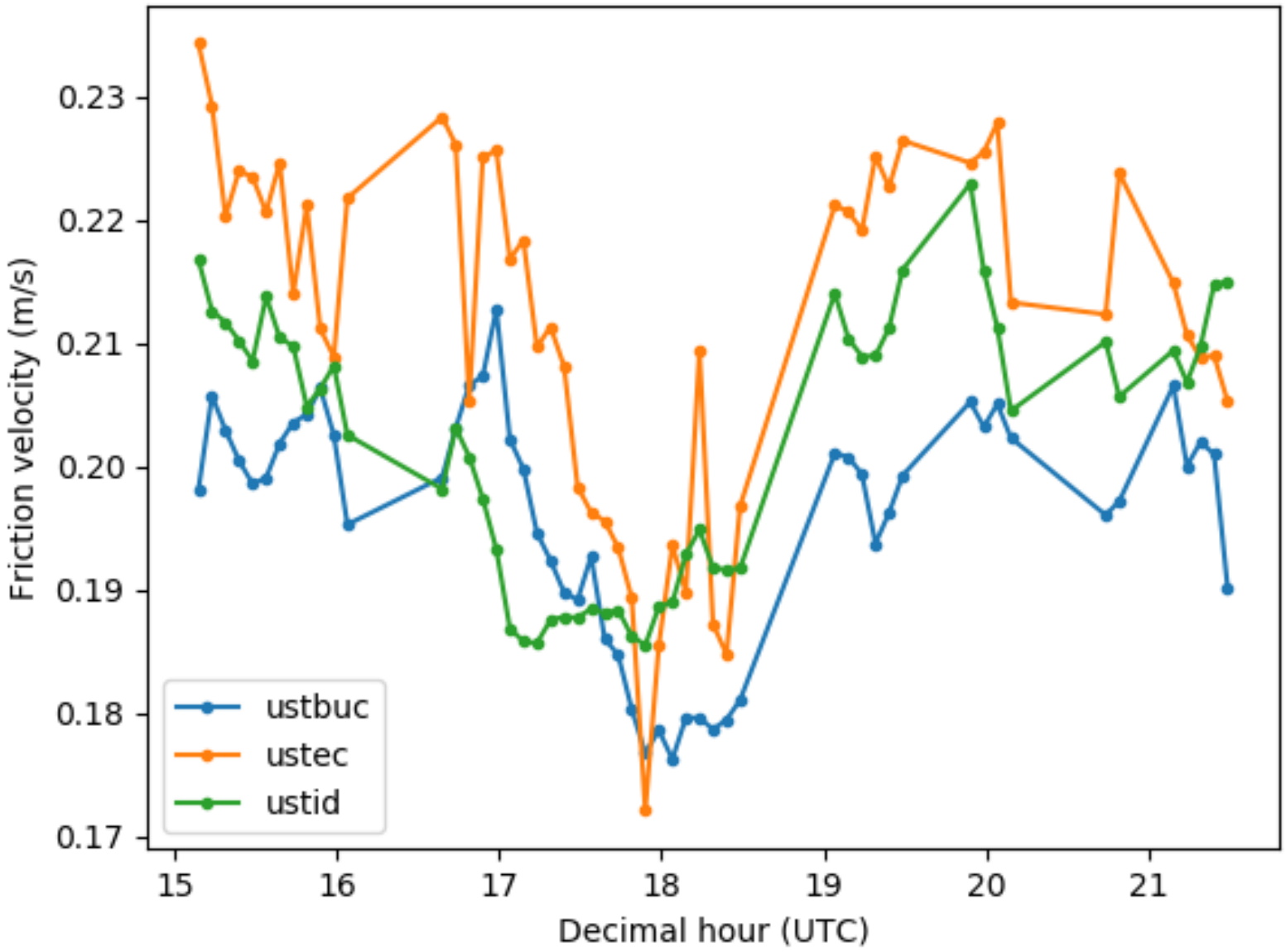
EUREC4A-OA ATALANTE OCARINA
January 25 2020

Momentum fluxes:

Measured Friction velocity u*

With different methods:
Bulk
Eddy Correlation
Inertio Dissipative

(Air→Sea
Momentum fluxes = ρ_{air} u^{*2})

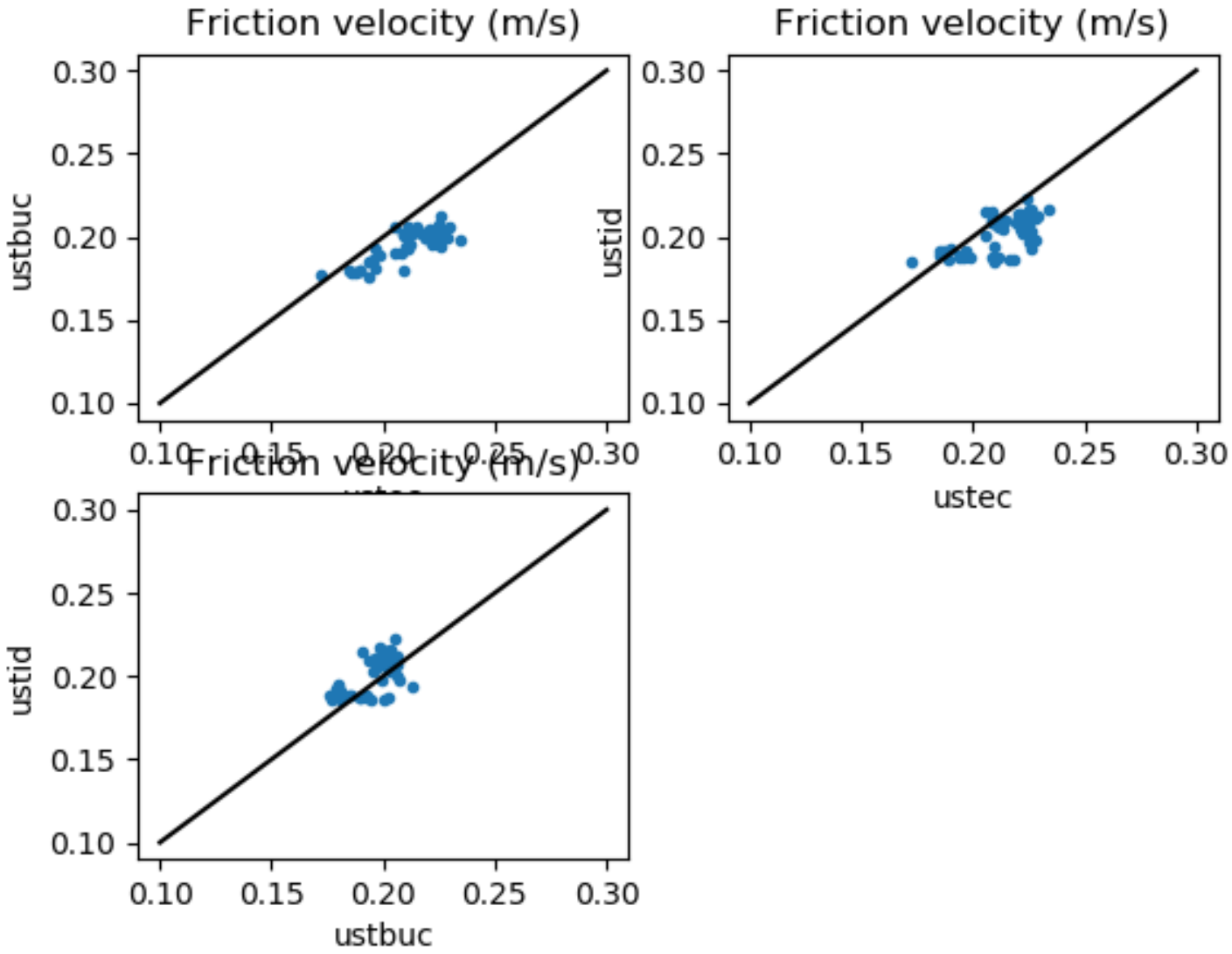


EUREC4A-OA ATALANTE OCARINA
January 25 2020

Measured Friction velocity u*

Comparison between methods

Bulk
Eddy Correlation
Inertio Dissipative

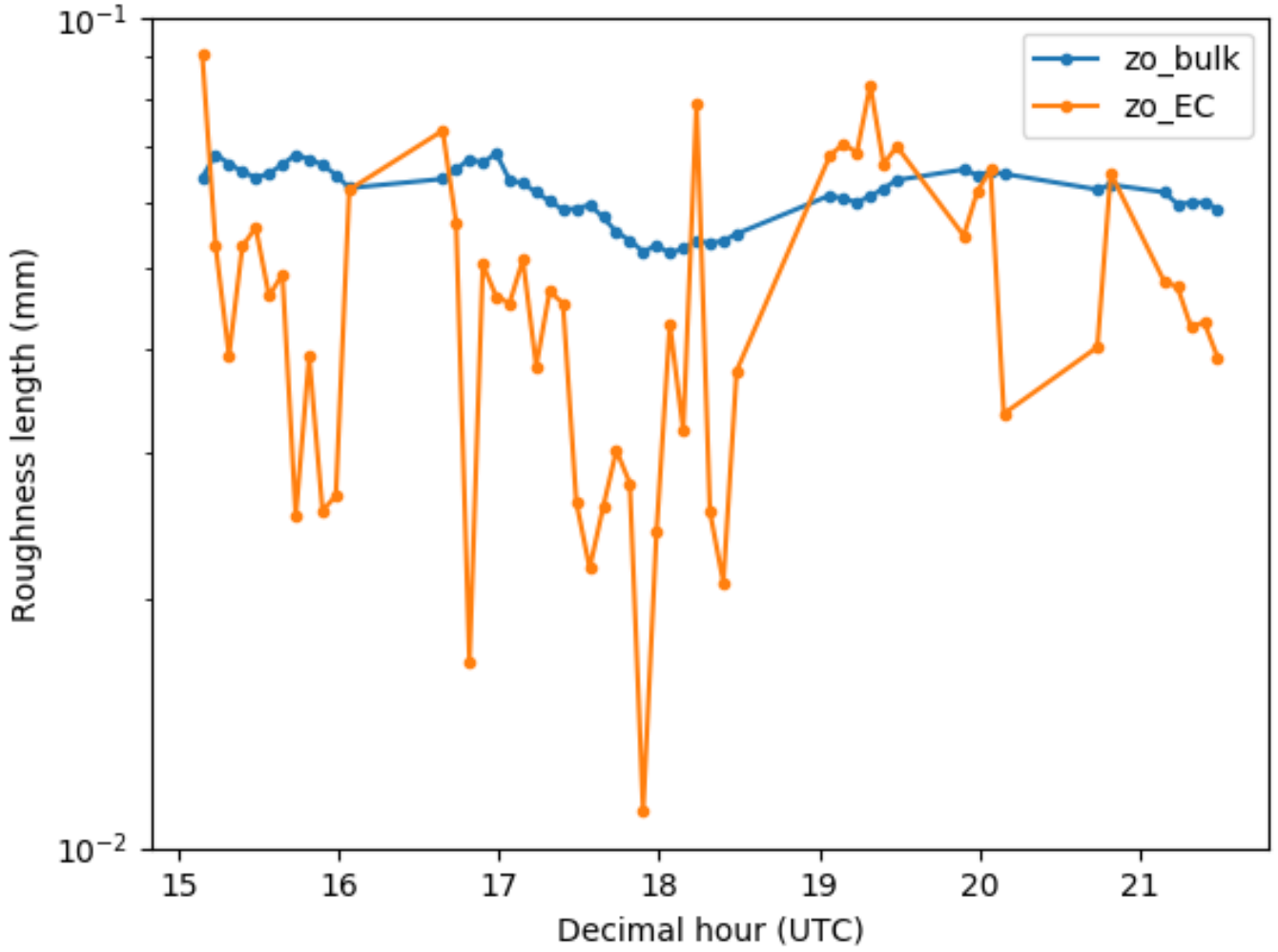


EUREC4A-OA ATALANTE OCARINA
January 25 2020

Aerodynamic roughness length **ZO**

Estimated: comparison between methods

Bulk
Eddy Correlation



EUREC4A-OA ATALANTE OCARINA
January 25 2020

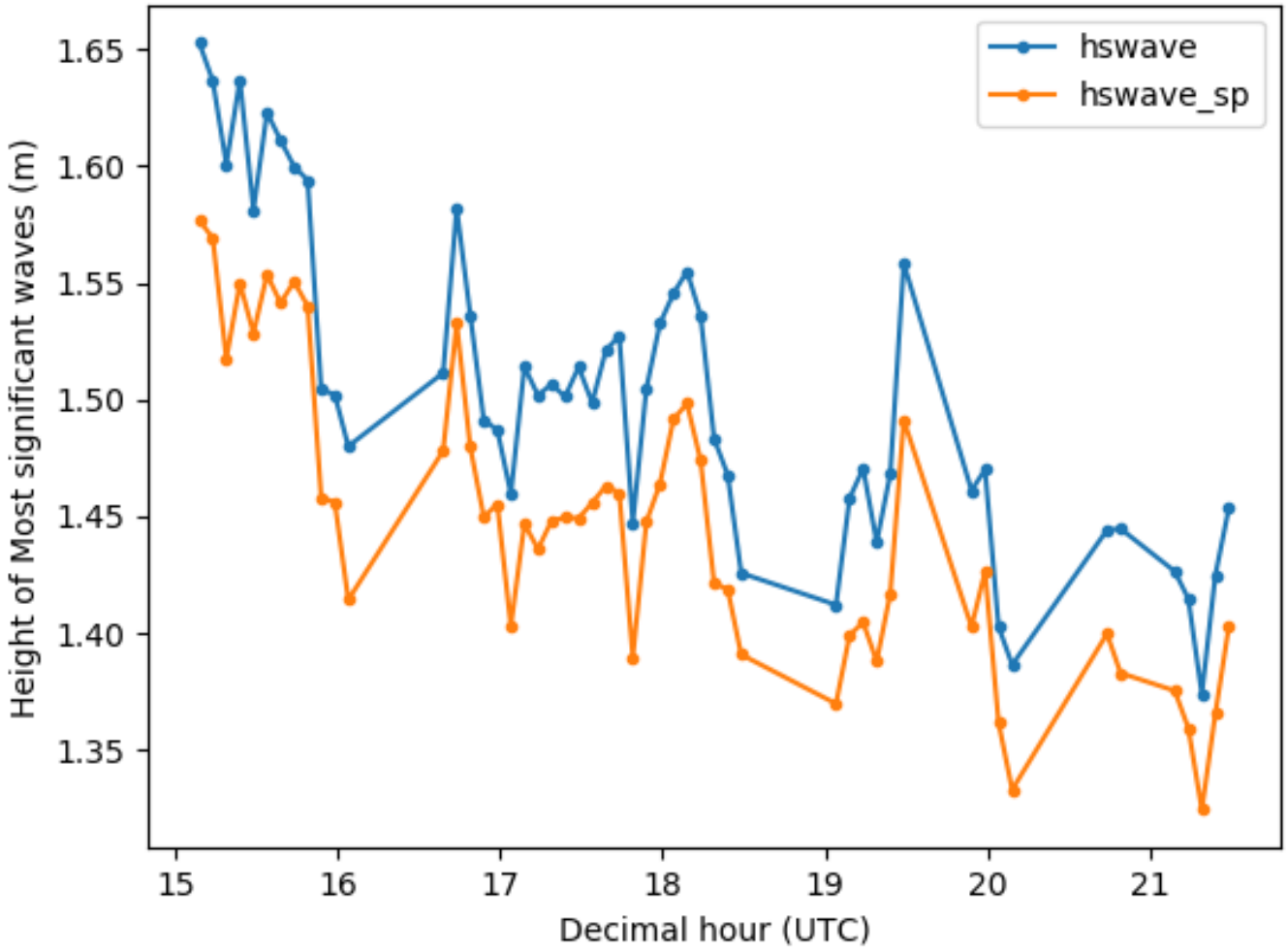
Ocarina is not really dedicated to measure waves, however, we may have some information.

Waves:

Significant Wave Height

SWH

Two methods
(integration, spectral)



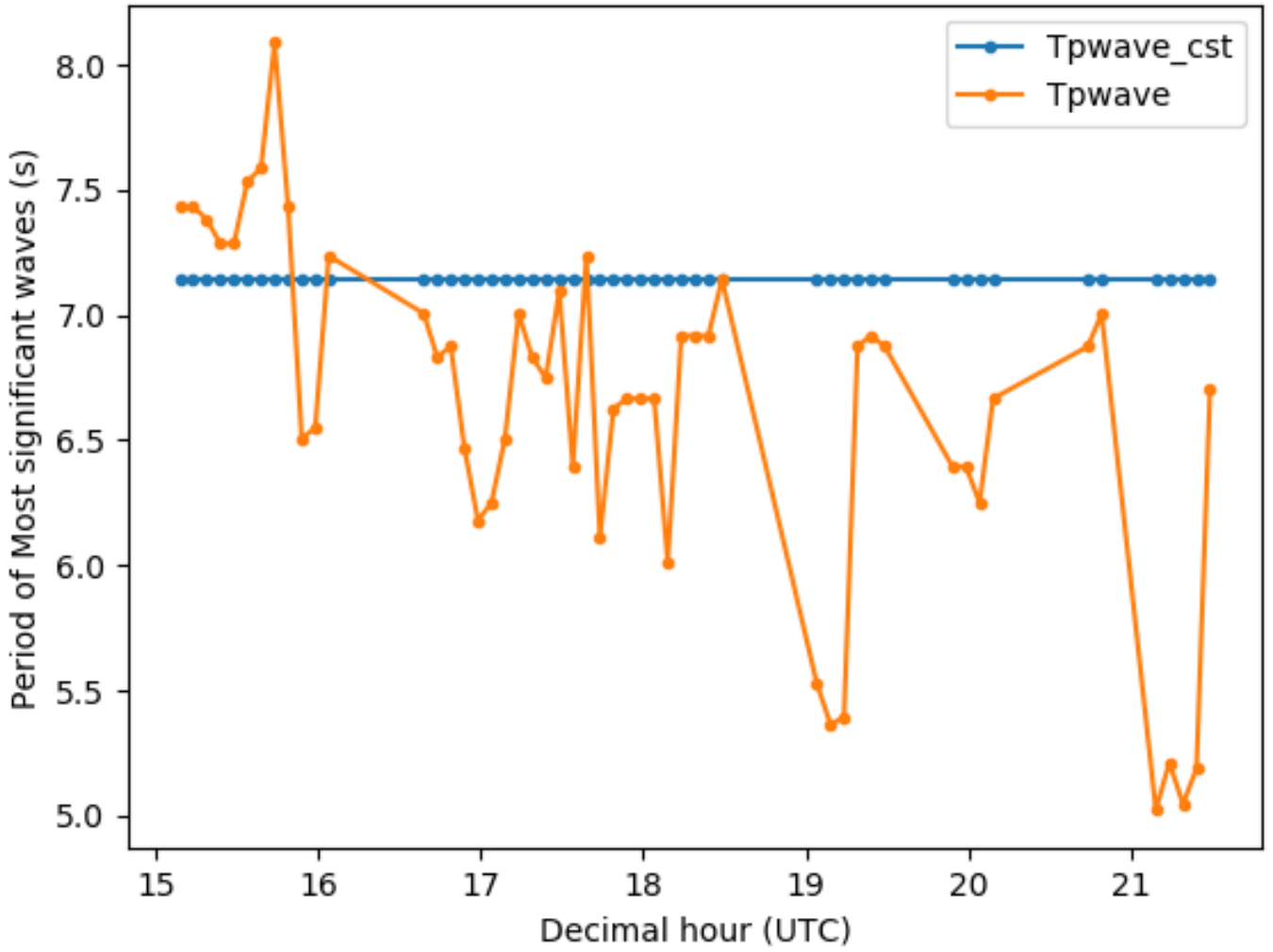
EUREC4A-OA ATALANTE OCARINA
January 25 2020

Ocarina is not really dedicated to measure waves, however, we may have some information.

Waves:
Peak Period

Tp

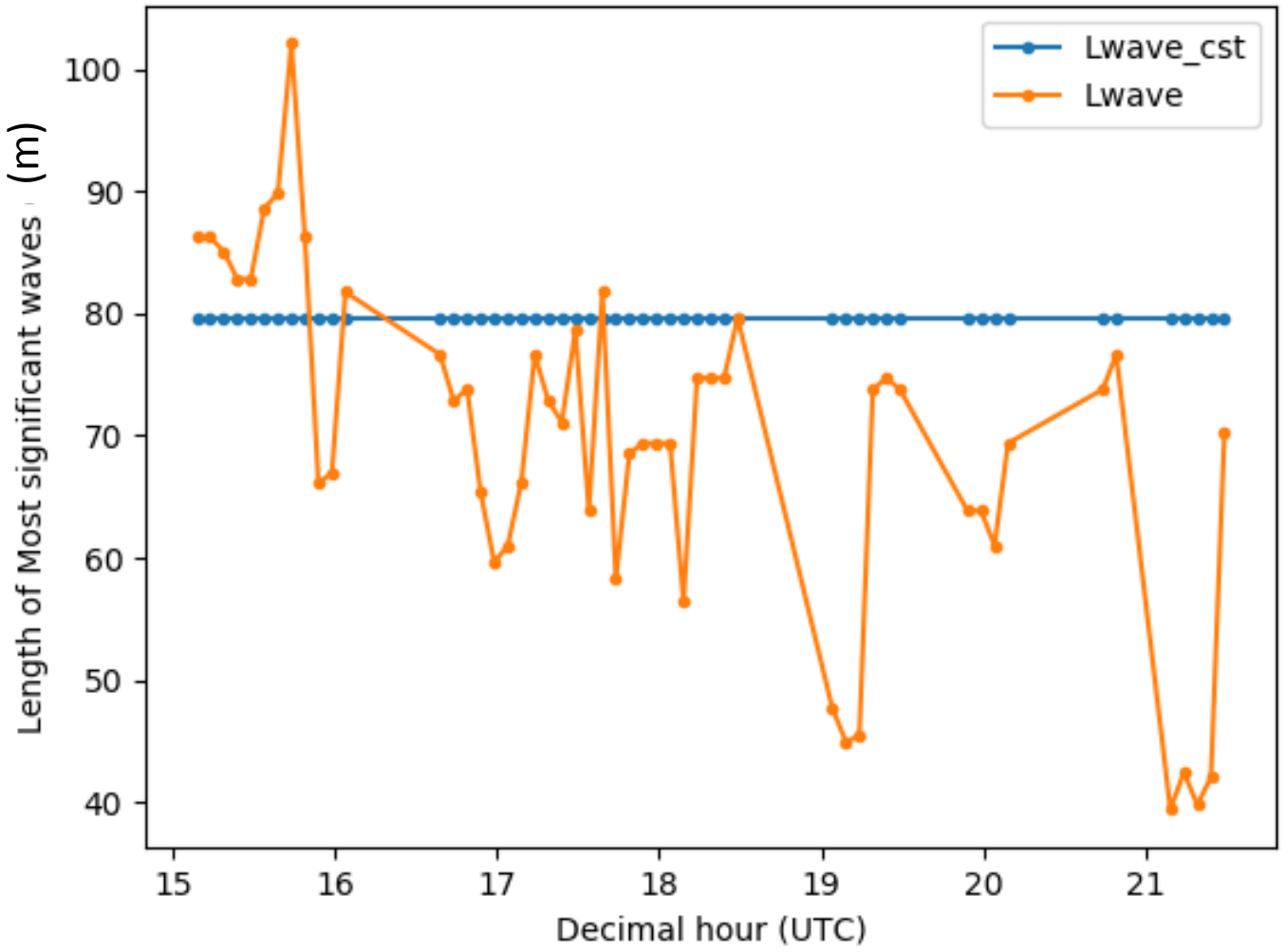
Two methods
(integration, spectral)



EUREC4A-OA ATALANTE OCARINA
January 25 2020

Ocarina is not really dedicated to measure waves, however, we may have some information.

Waves:
Dominant wavelength (m)



EUREC4A-OA ATALANTE OCARINA
January 25 2020

Ocarina is not really dedicated to measure waves, however, we may have some information.

Waves:
Wave age

C / u*

Three methods
(Bulk 1, Bulk2, Eddy correlation)