Table S1. Sensors importance in balloon and UAV-based campaigns.

Sensor/Parameter	Air temperature	Relative humidity	Atmospheric pressure	Wind speed
UAV-based campaign				
Sensor/Parameter	Air temperature	Relative humidity	Atmospheric pressure	Wind speed
Default	Thermocouple type T	BME280	BME280	TriSonica^{TM}
Option 1	BME280	-	-	-
Balloon campaign				
Sensor/Parameter	Air temperature	Relative humidity	Atmospheric pressure	Wind speed
Default	Thermocouple type T	BME280	BME280	HY-WDC6SE
Option 1	BME280	HY-WDC6SE	HY-WDC6SE	TriSonica^{TM}
Option 2	HY-WDC6SE	-	-	-

Table S2. Sensors used in UAV-based and balloon campaigns.

| No.	Platform	Air temp.	Rel. Hum.	Atm. Pressure	Wind speed
1	BAL	HY-WDC6SE	HY-WDC6SE	HY-WDC6SE	HY-WDC6SE
2	BAL	Thermocouple	BME280	BME280	HY-WDC6SE
3	BAL	Thermocouple	BME280	BME280	HY-WDC6SE (TriSonicaTM - 1 flight)
4	BAL	Thermocouple	BME280	BME280	HY-WDC6SE
5	BAL	Thermocouple	BME280	BME280	HY-WDC6SE
6	DRO	Thermocouple	BME280	BME280	TriSonicaTM
7	BAL	Thermocouple	BME280	BME280	HY-WDC6SE and TriSonicaTM (7 flights)
8	BAL	Thermocouple	BME280	BME280	HY-WDC6SE
9	BAL	Thermocouple	BME280	BME280	HY-WDC6SE
10	DRO	Thermocouple	BME280	BME280	TriSonicaTM
11	DRO	Thermocouple	BME280	BME280	TriSonicaTM

https://www.overleaf.com/project/627b8d5ccf85b0d9dc199747

1
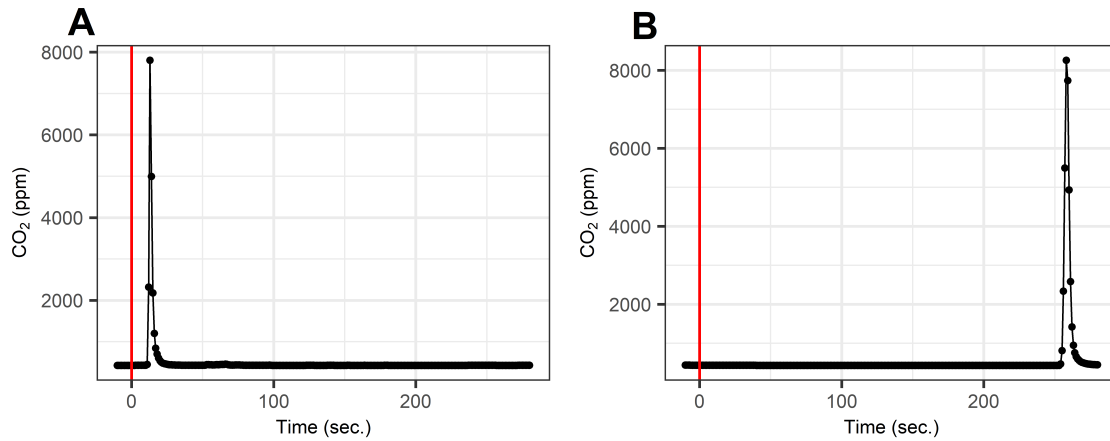
Figure S1. Evolution of 1s averaged CO_2 mole fraction during breath test as measured by the Picarro analyser with tube of (A) 10 m and (B) 200 m length. The vertical red line represents the moment of exhalation of air to the tube.
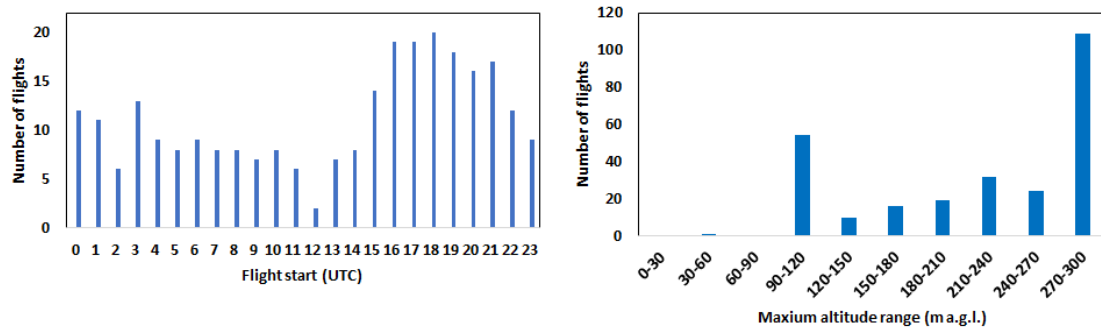
2

Figure S2. Flight characteristics: (a) flight take-off; (b) maximum flight altitude.
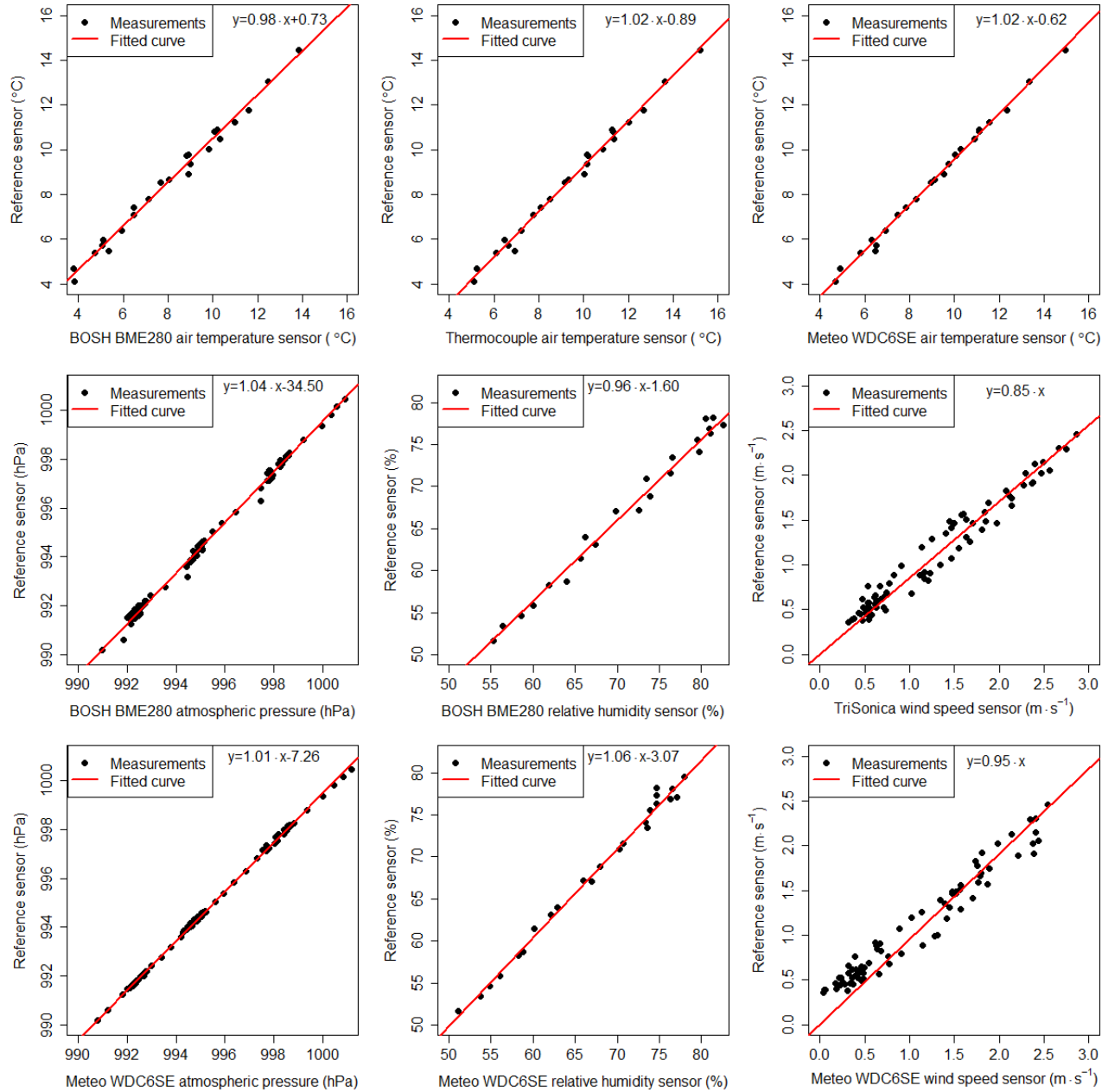
https://www.overleaf.com/project/62

Figure S3. Calibration of meteorological sensors used in the measurements, the temporal resolution of all parameters is equal to 1 hour.
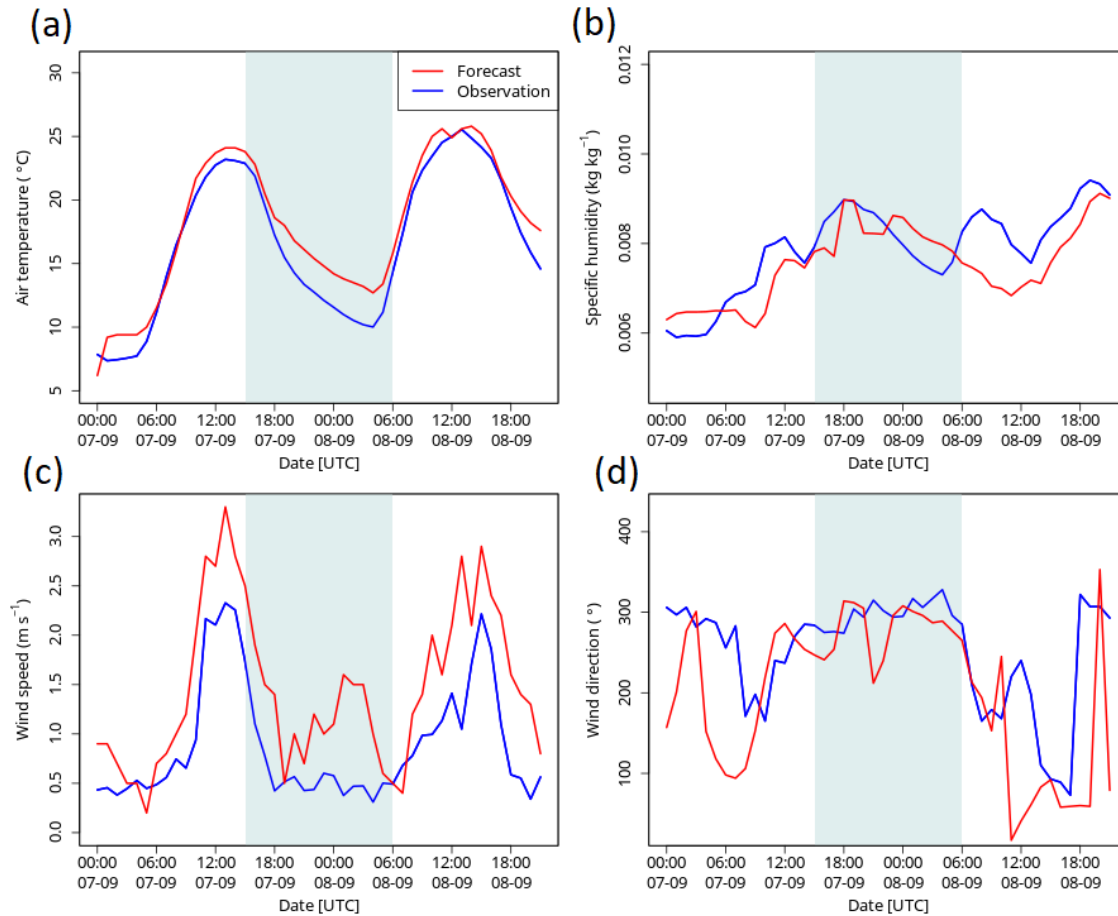
Figure S4. Time course of predicted and observed (a) air temperature at 2 m a.g.l., (b) specific humidity at 2 m a.g.l., (c) wind speed at 20 m a.g.l. and (d) wind direction at at 20 m a.g.l. for Reymonta St. station between 7 and 9 September 2021. Forecast of meteorological conditions comes from most nested domain (domain with horizontal grid spacing 200 x 200 m).
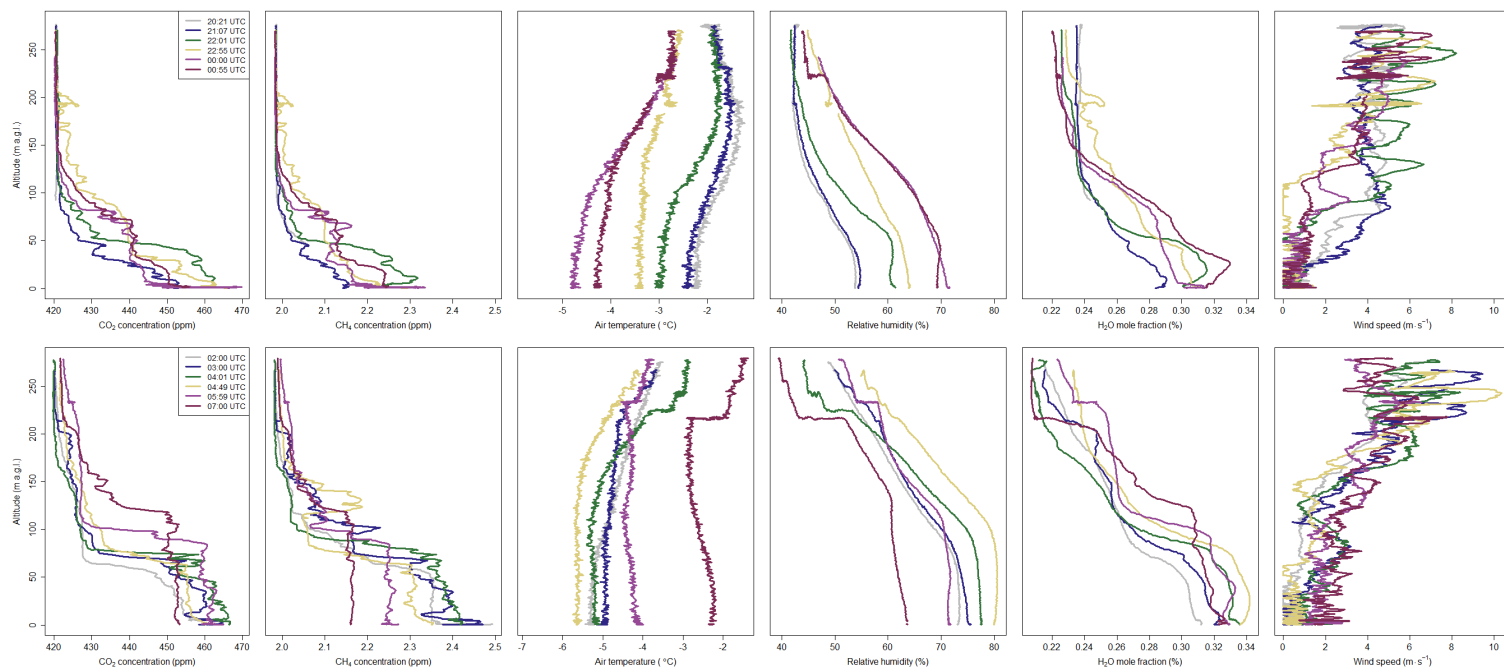
Figure S5. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 10-11.03.2021 - campaign 1.
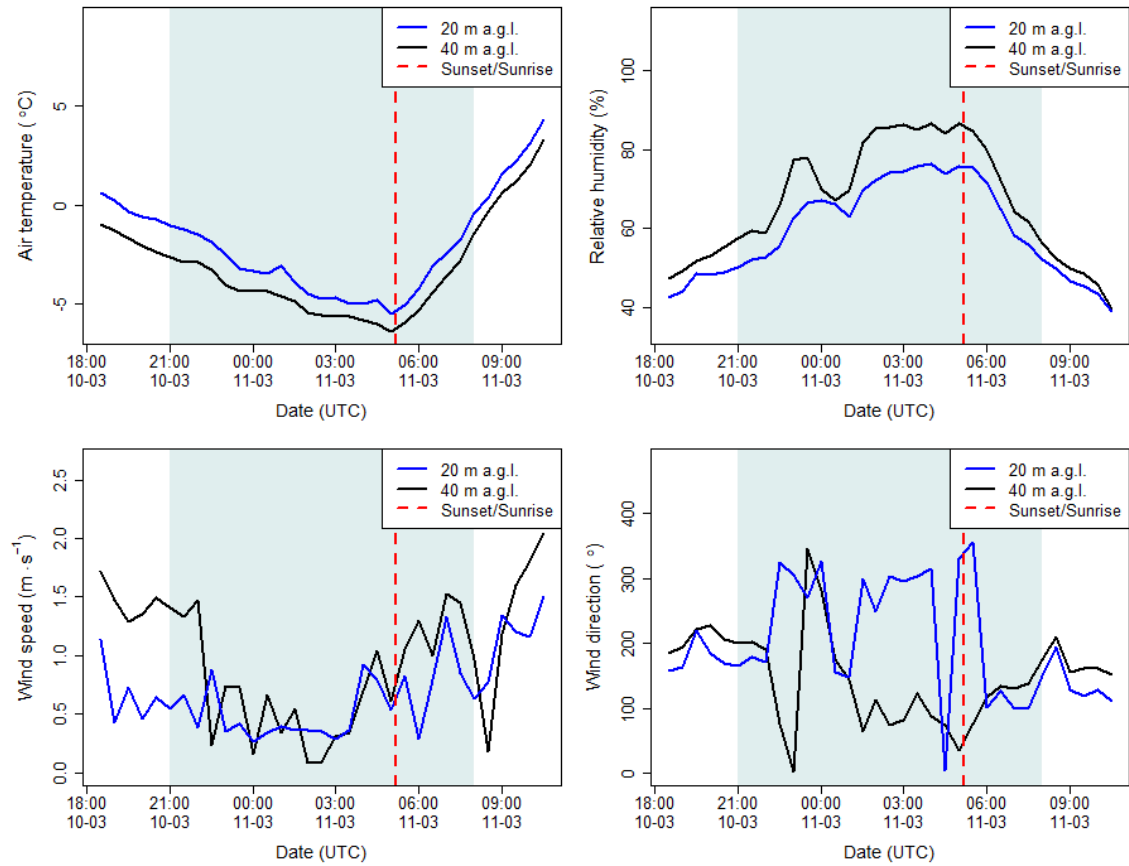
Figure S6. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 10-11.03.2021 - campaign 1. Azure background presents campaign duration.
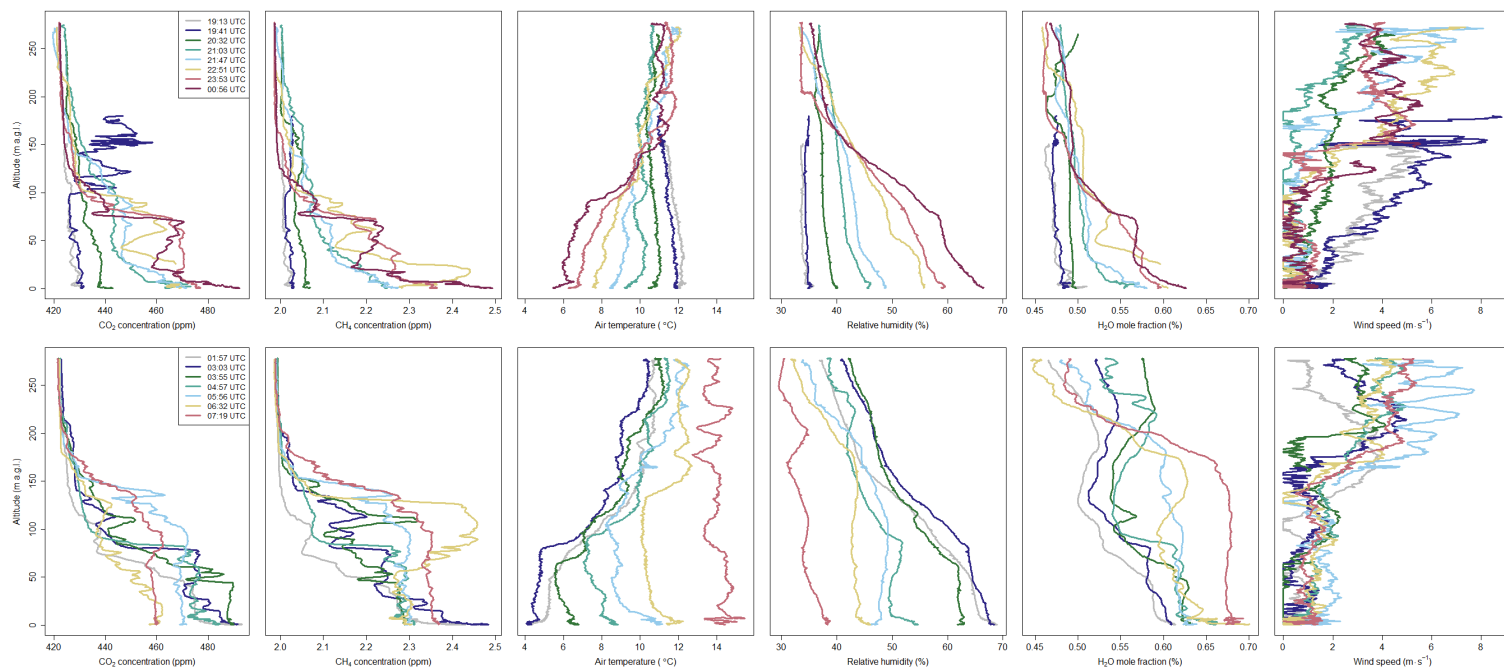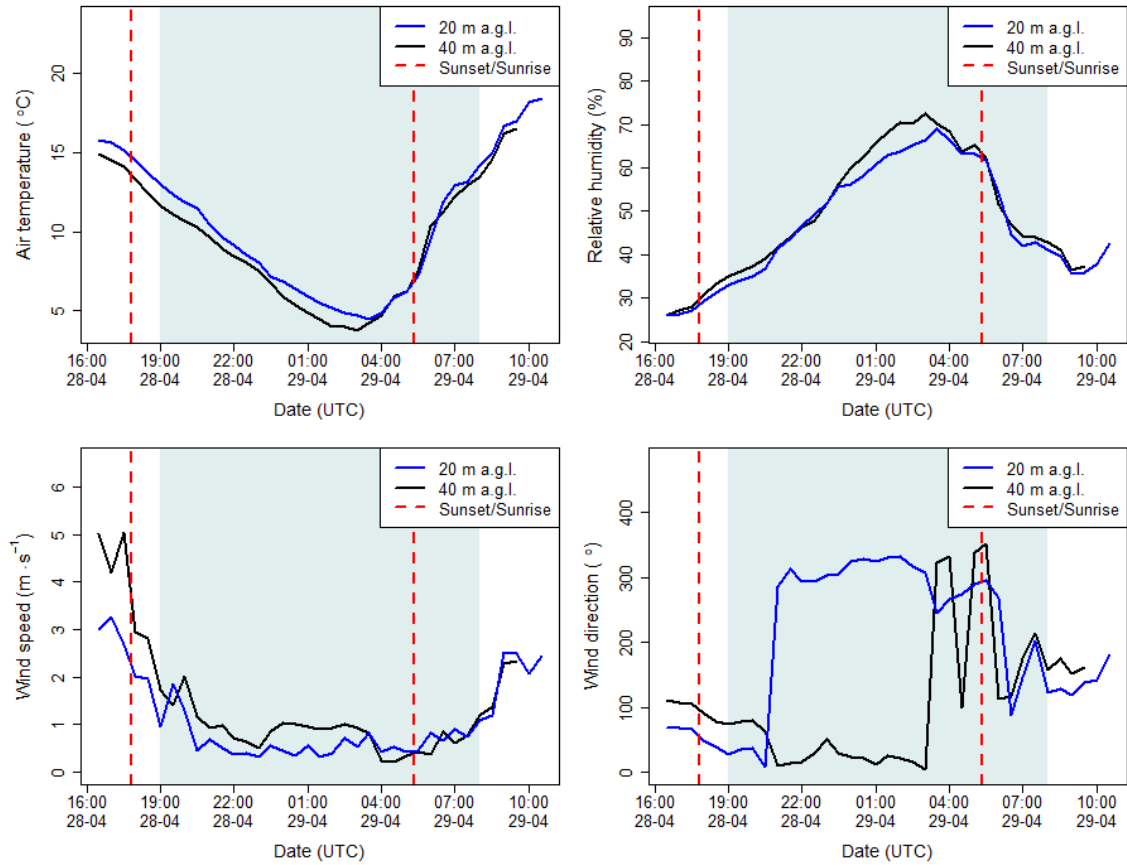
Figure S7. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 28-29.04.2021 - campaign 2.

Figure S8. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 28-29.04.2021 - campaign 2. Azure background presents campaign duration.
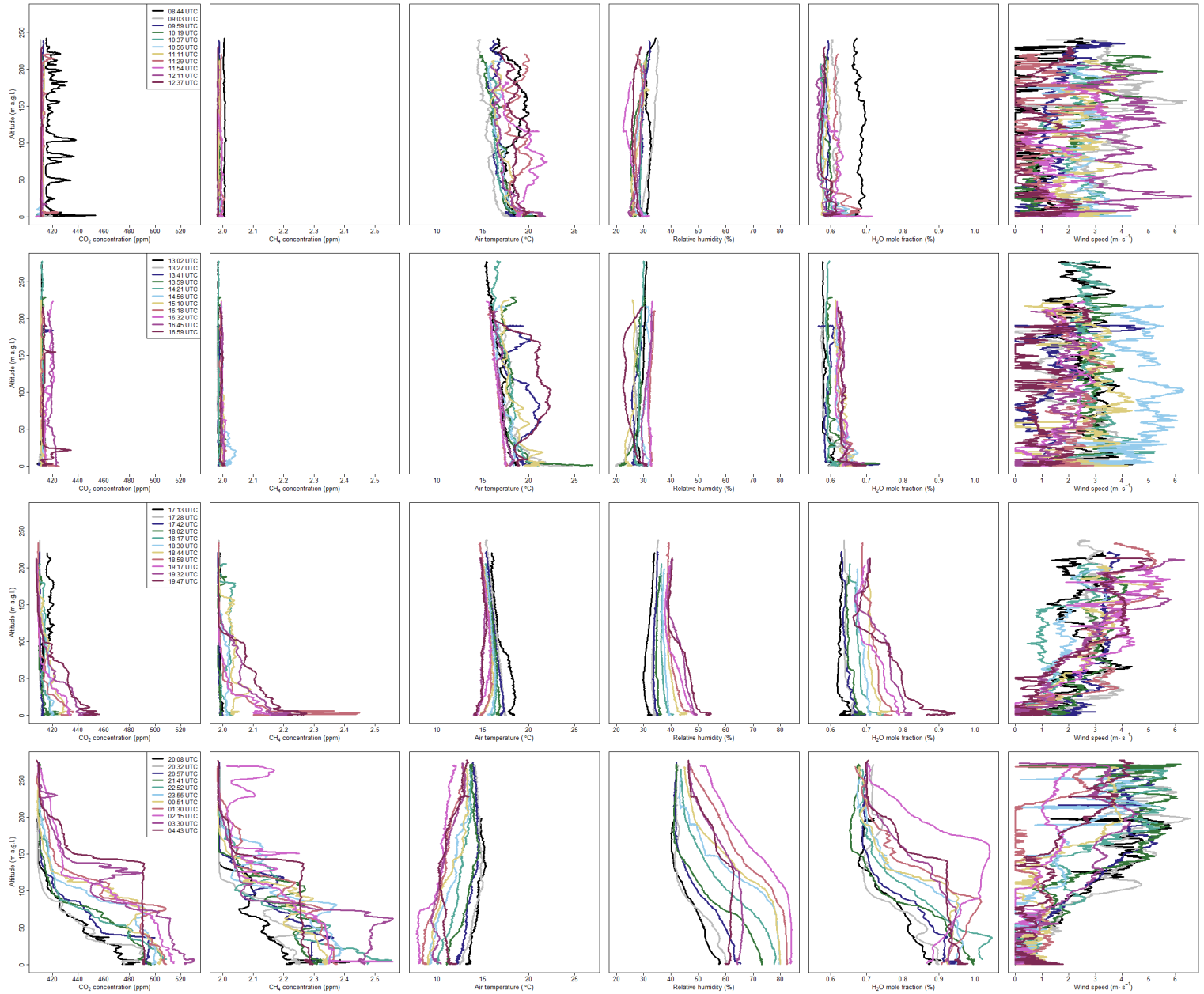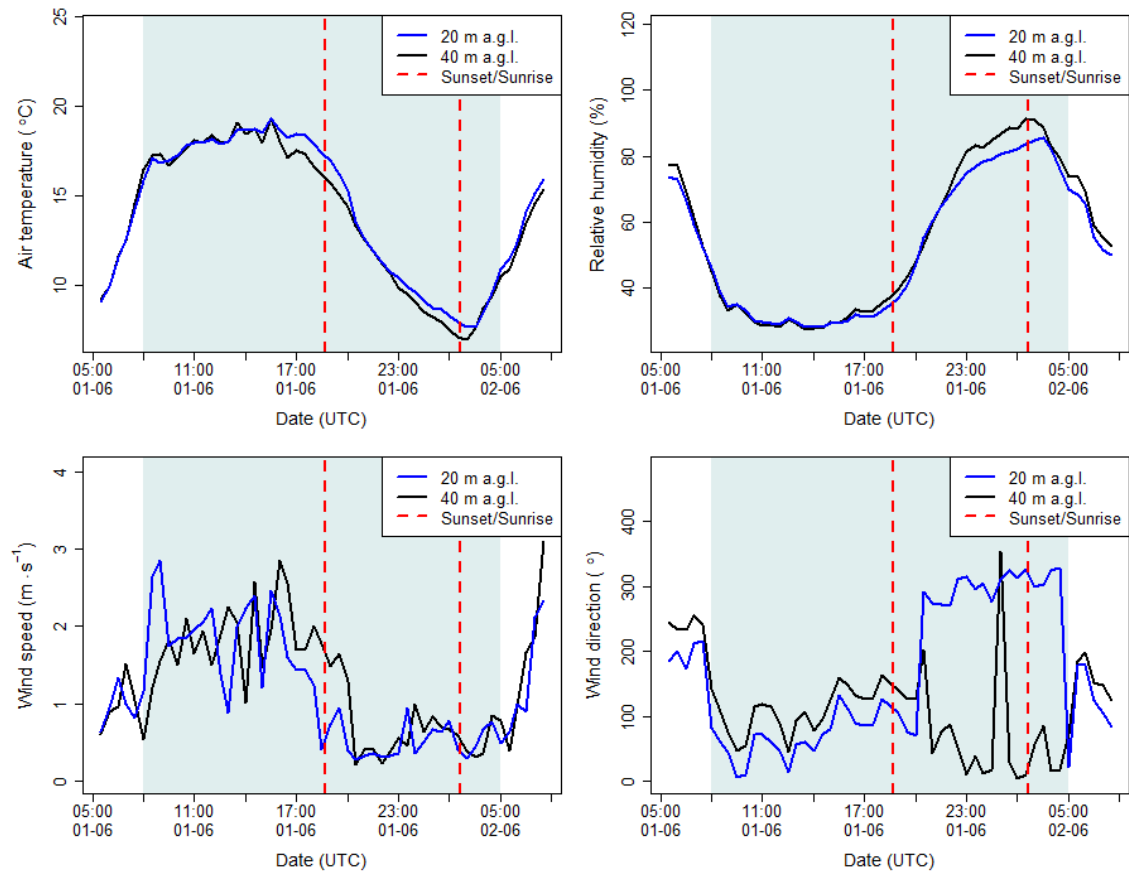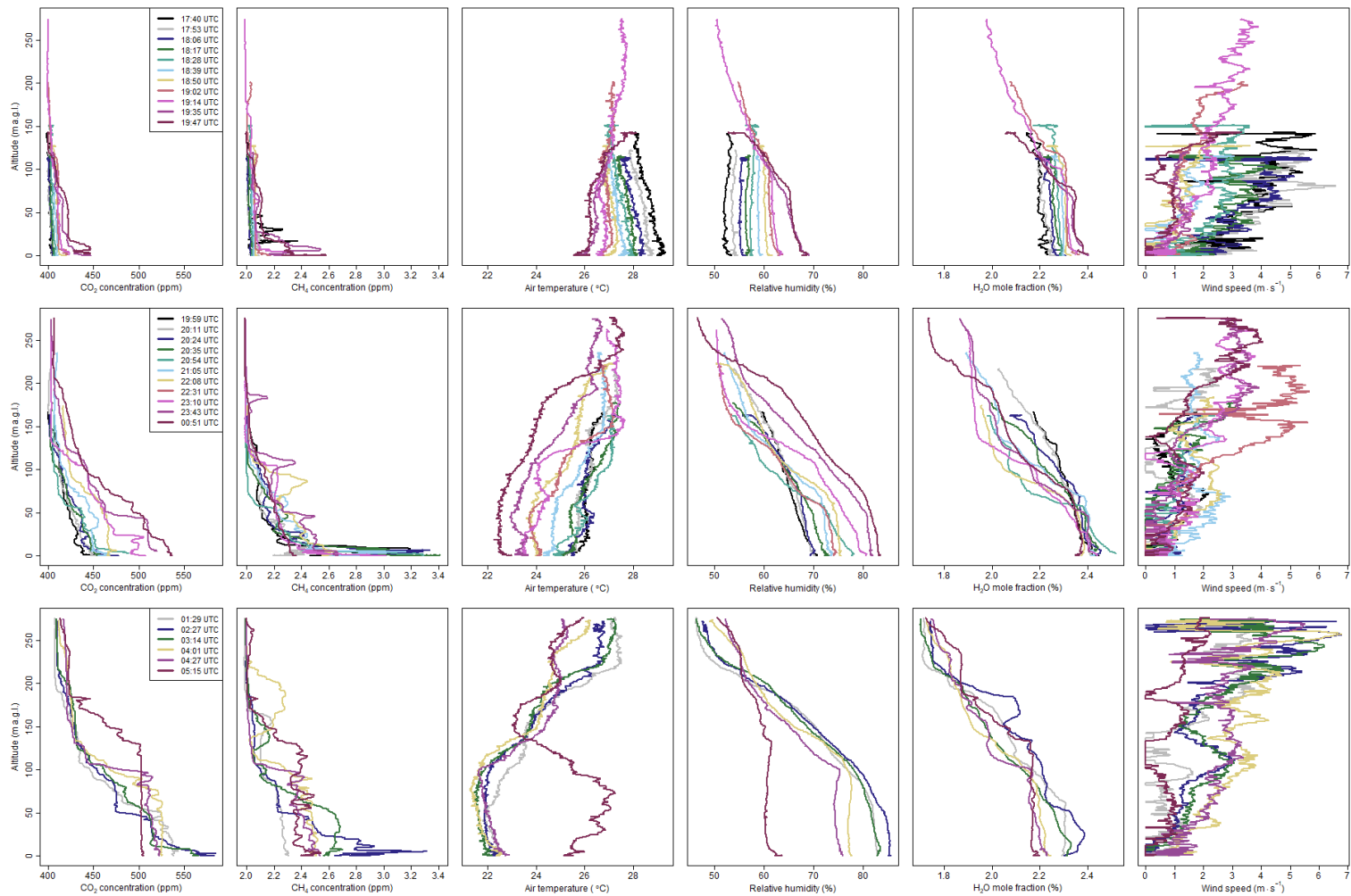
Figure S9. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 01-02.06.2021 - campaign 3.
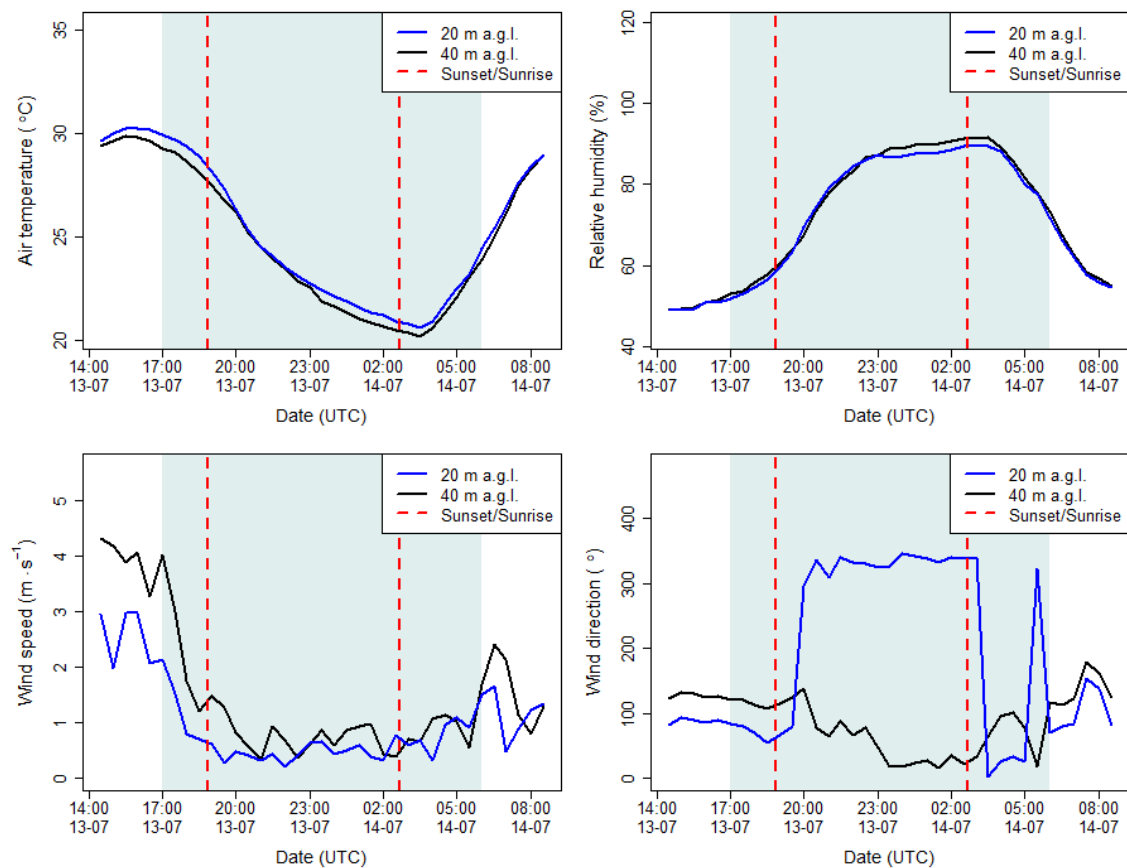
Figure S10. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 01-02.06.2021 - campaign 3. Azure background presents campaign duration.

Figure S11. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 13-14.07.2021 - campaign 4.

Figure S12. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 13-14.07.2021 - campaign 4. Azure background presents campaign duration.
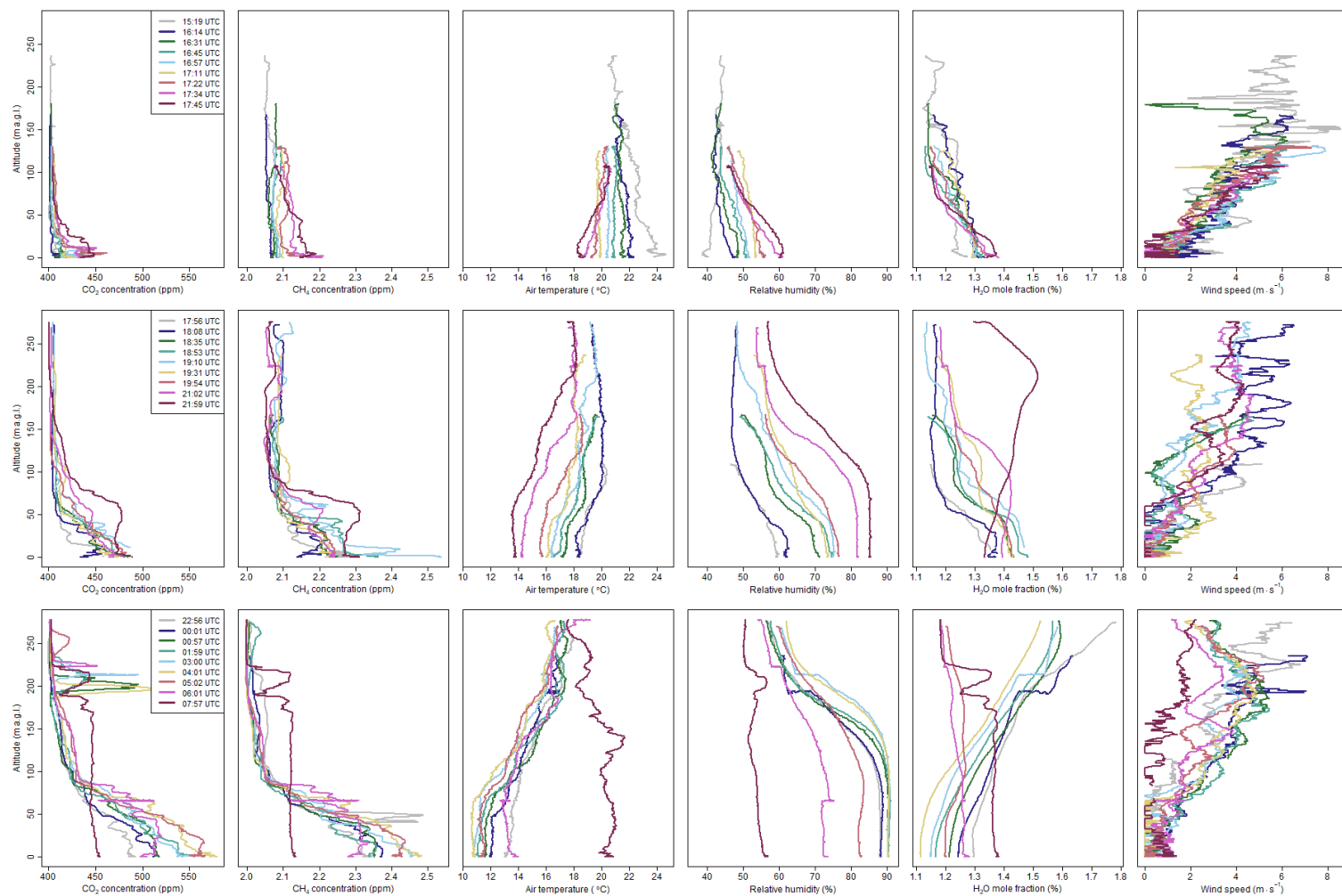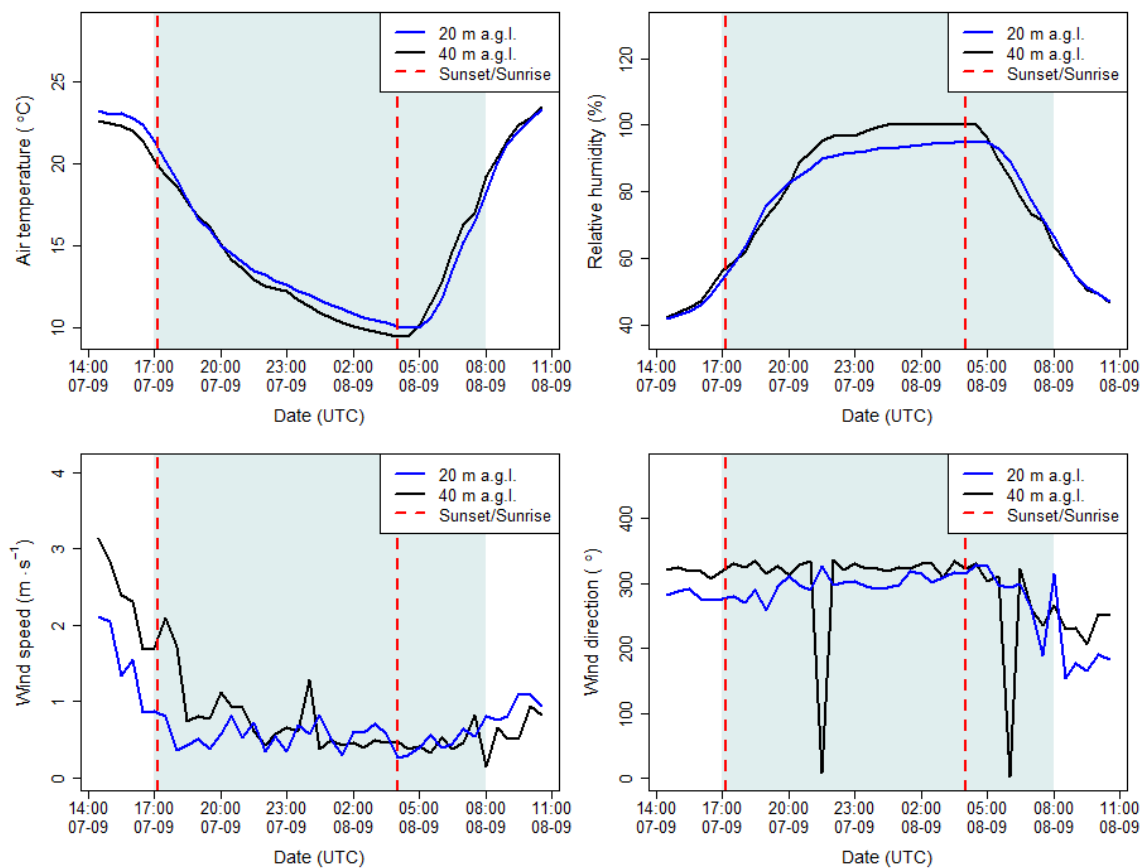
Figure S13. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 07-08.09.2021 - campaign 5.

Figure S14. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 07-08.09.2021 - campaign 5. Azure background presents campaign duration.
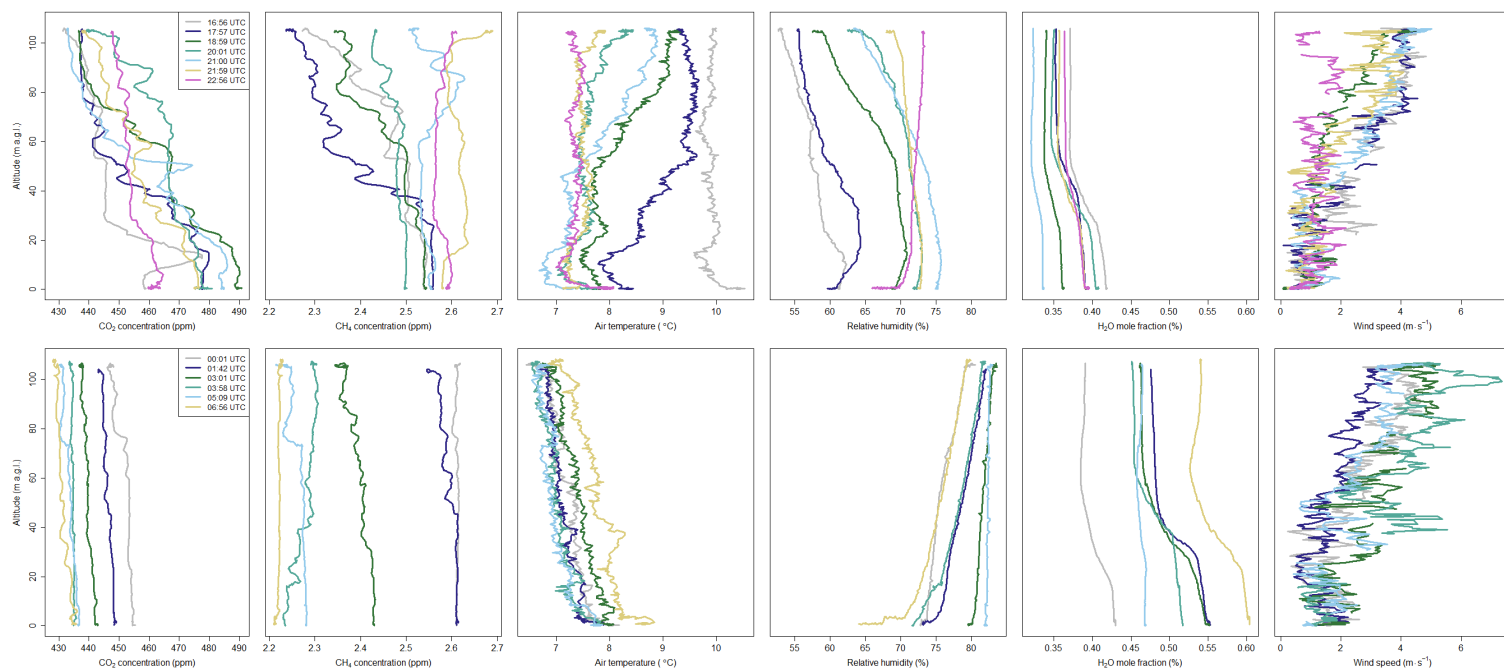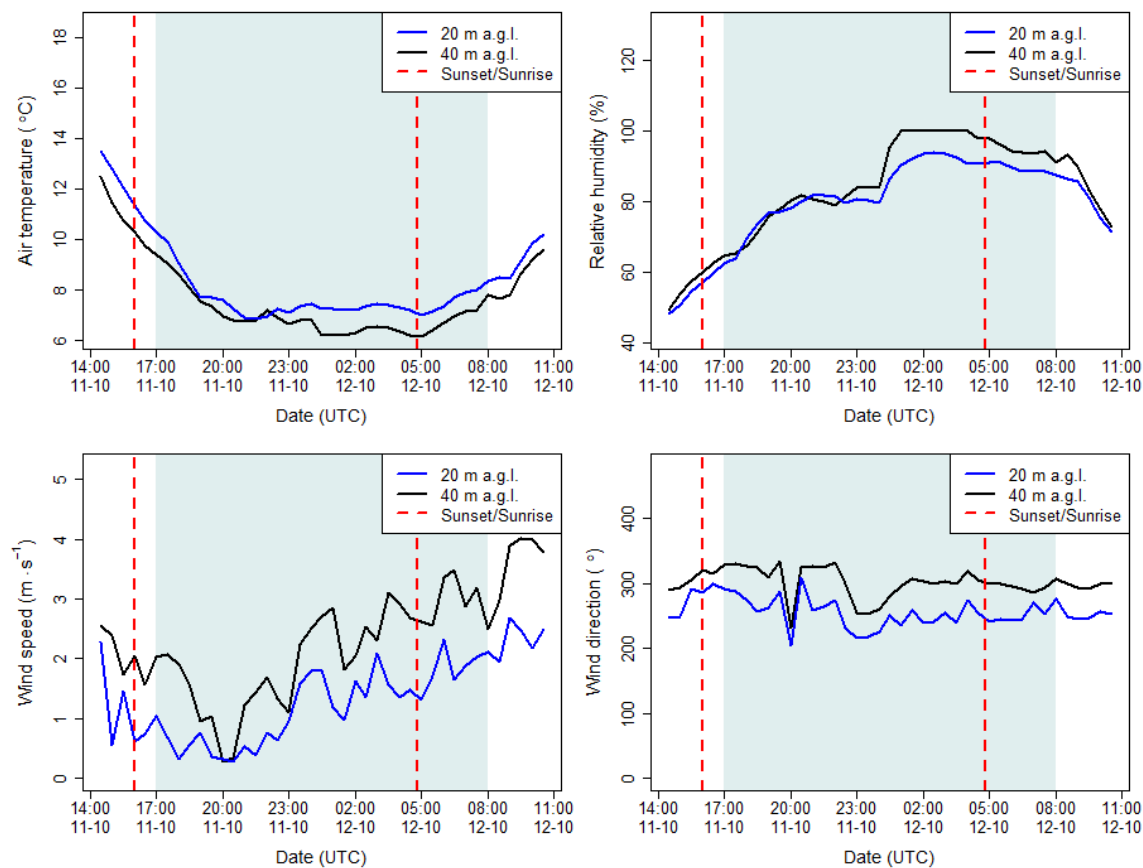
Figure S15. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 11-12.10.2021 - campaign 6.

Figure S16. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 11-12.10.2021 - campaign 6. Azure background presents campaign duration.
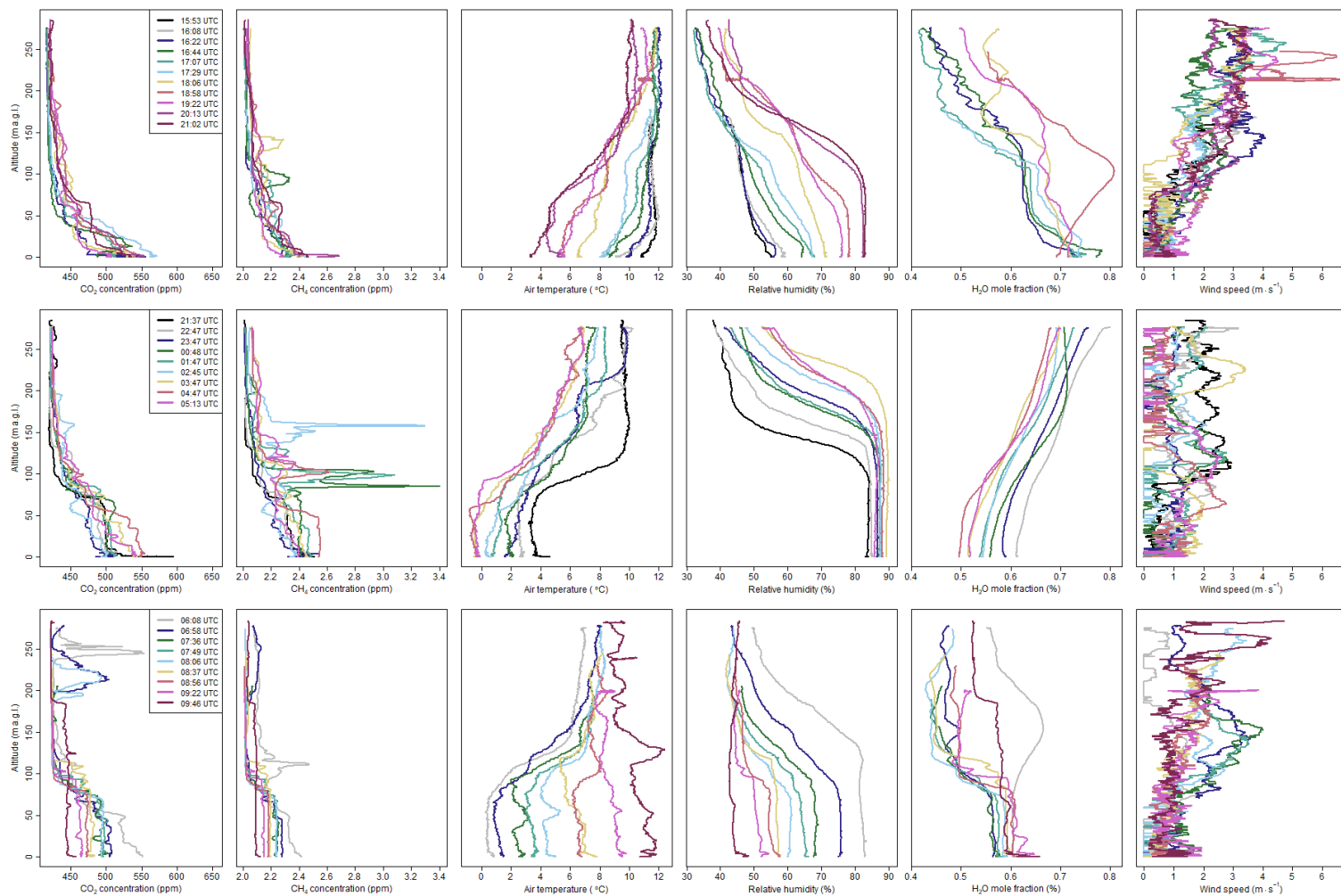
Figure S17. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 25-26.10.2021 - campaign 7.
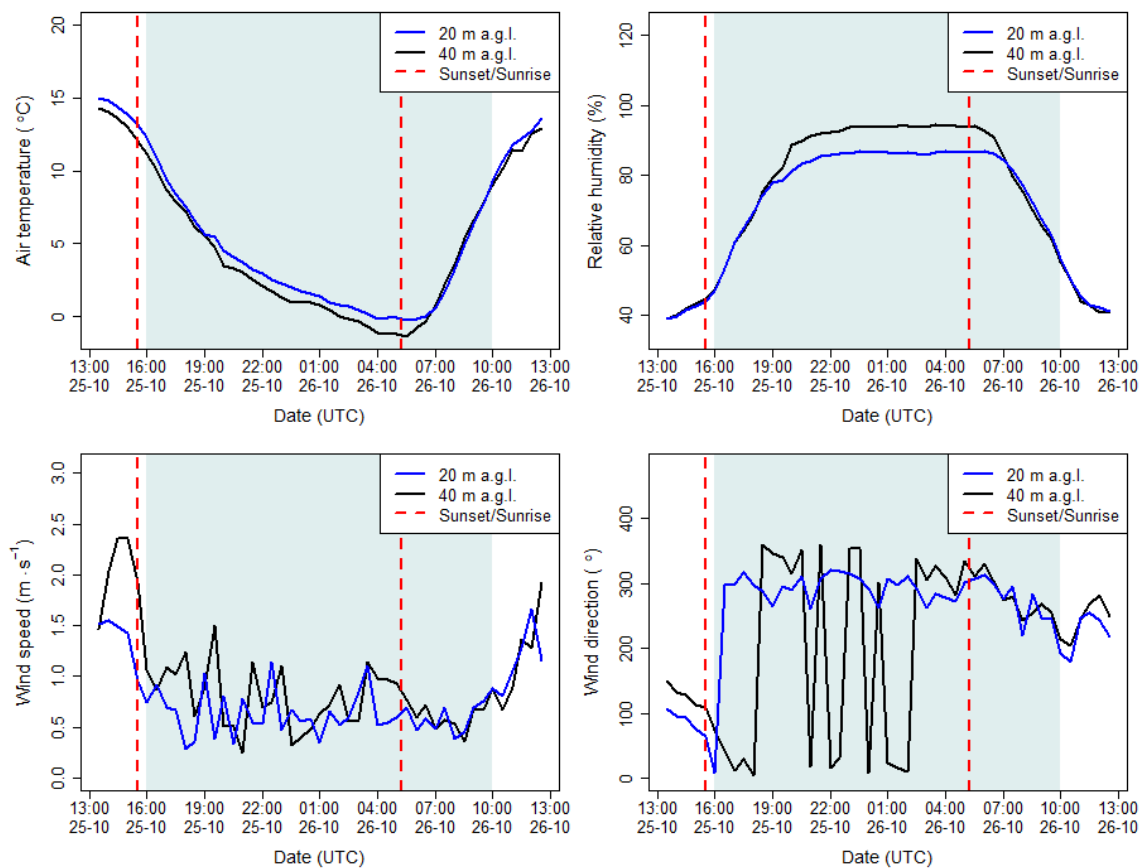
Figure S18. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 25-26.10.2021 - campaign 7. Azure background presents campaign duration.
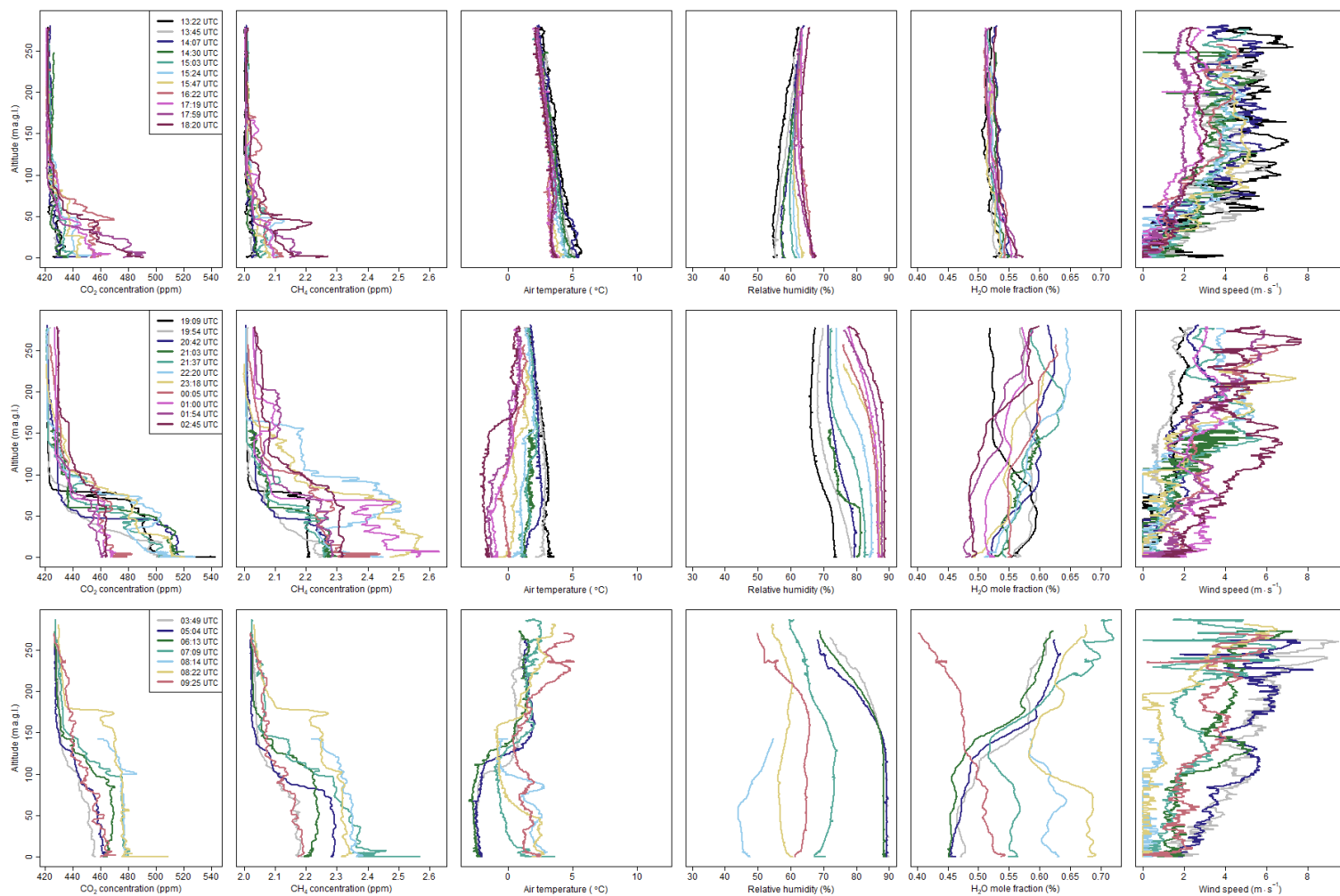
Figure S19. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 24-25.11.2021 - campaign 8.
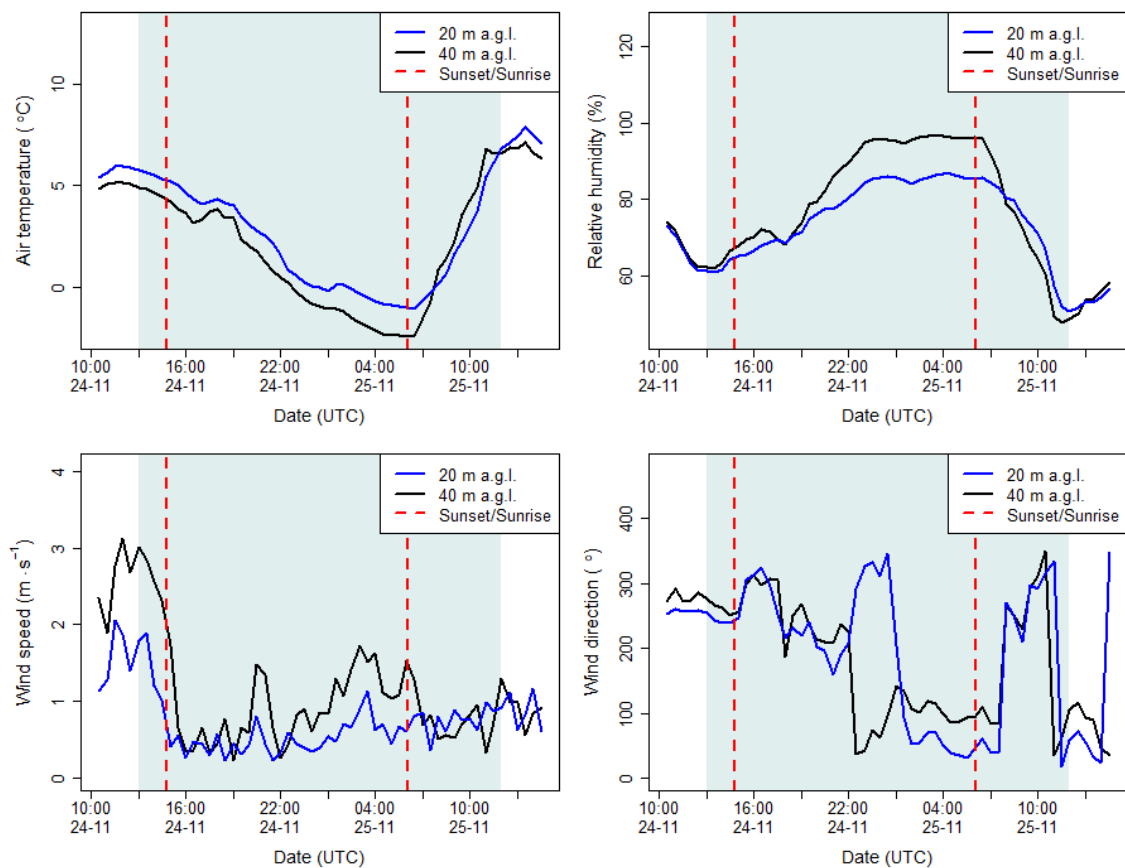
Figure S20. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 24-25.11.2021 - campaign 8. Azure background presents campaign duration.
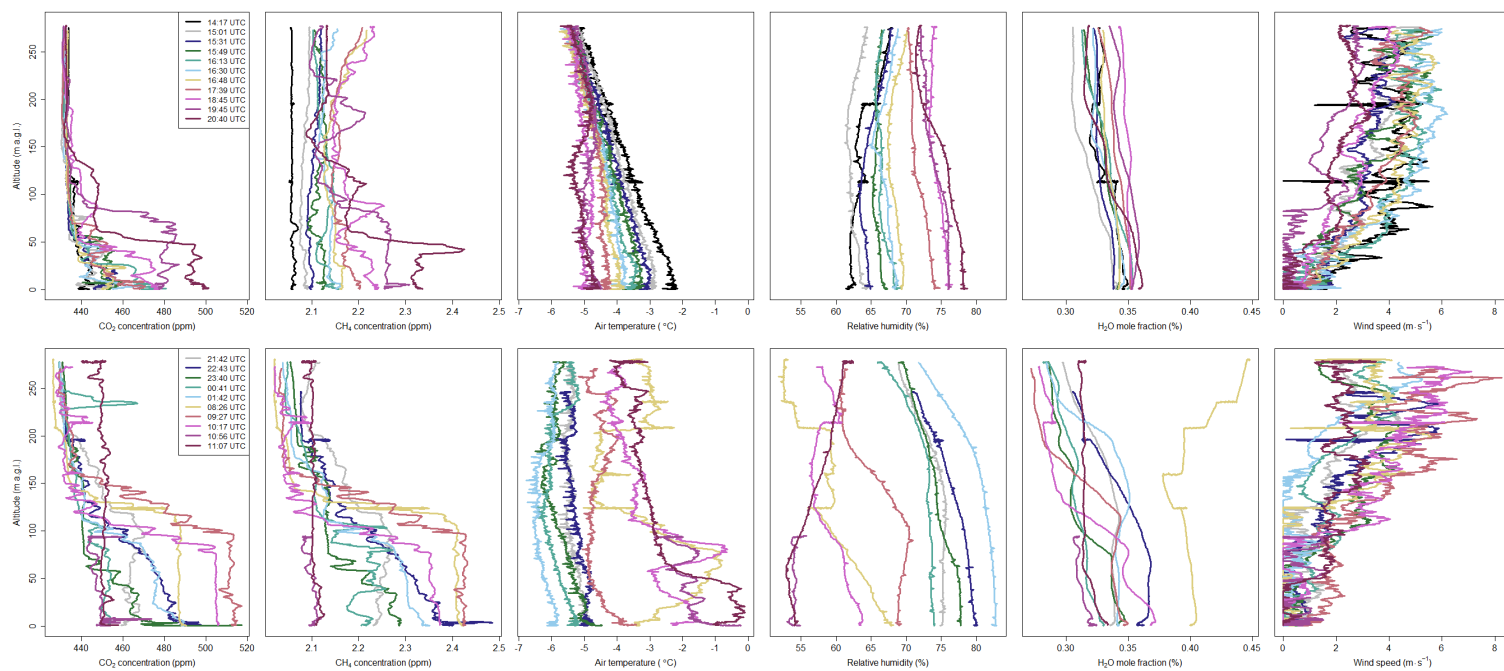
Figure S21. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 22-23.12.2021 - campaign 9.
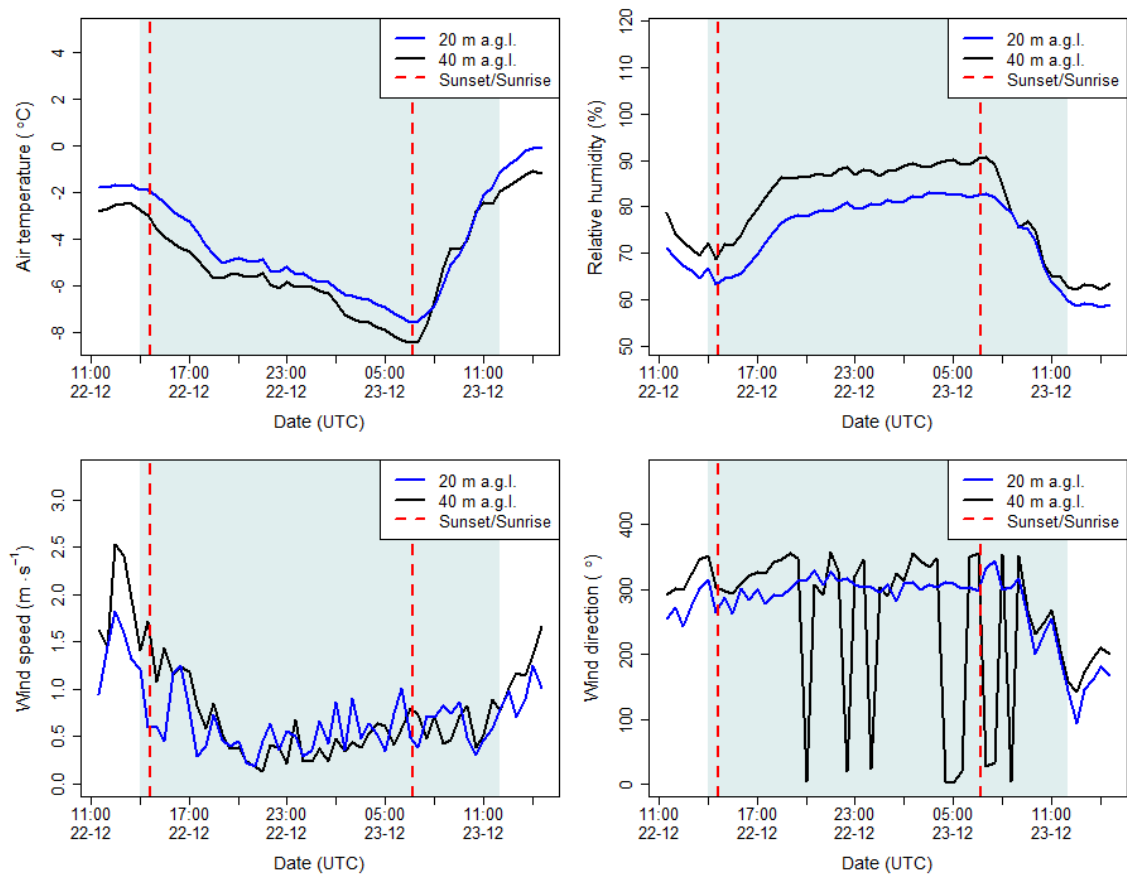
Figure S22. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 22-23.12.2021 - campaign 9. Azure background presents campaign duration.
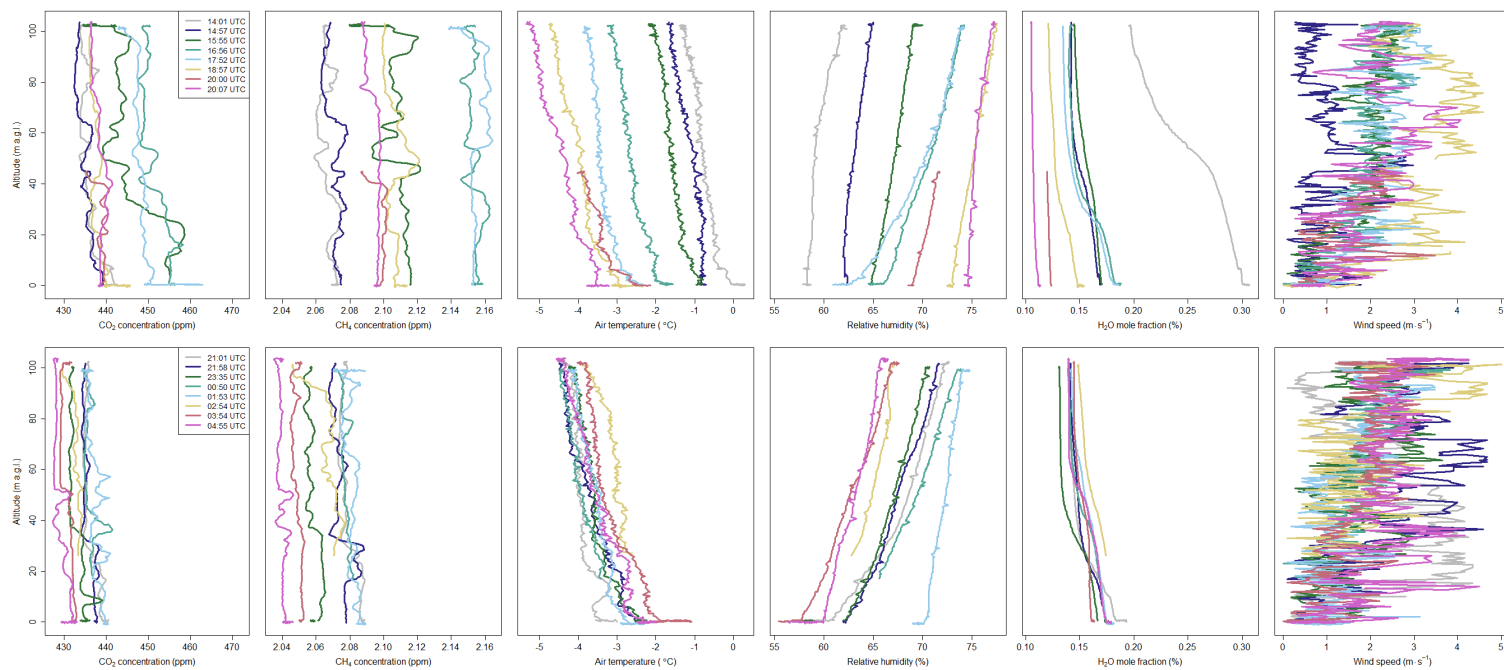
Figure S23. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 11-12.01.2022 - campaign 10.
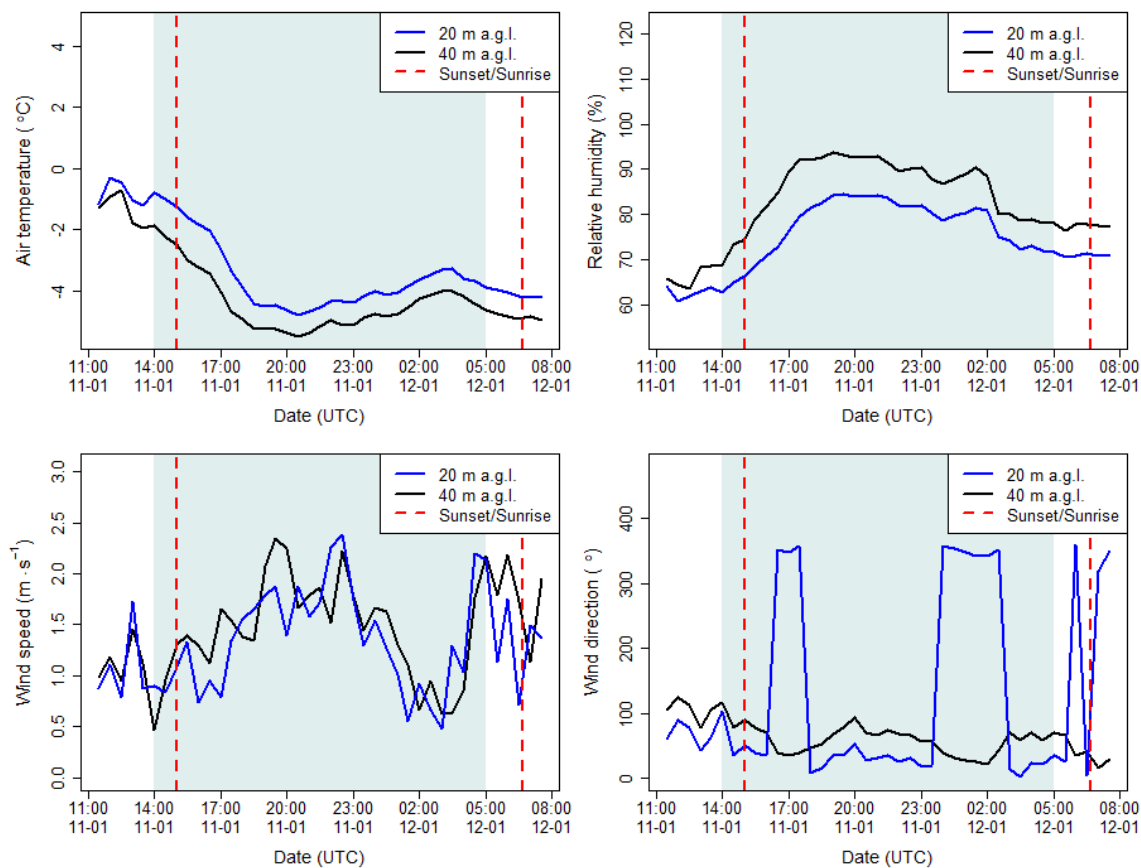
Figure S24. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 11-12.01.2022 - campaign 10. Azure background presents campaign duration.
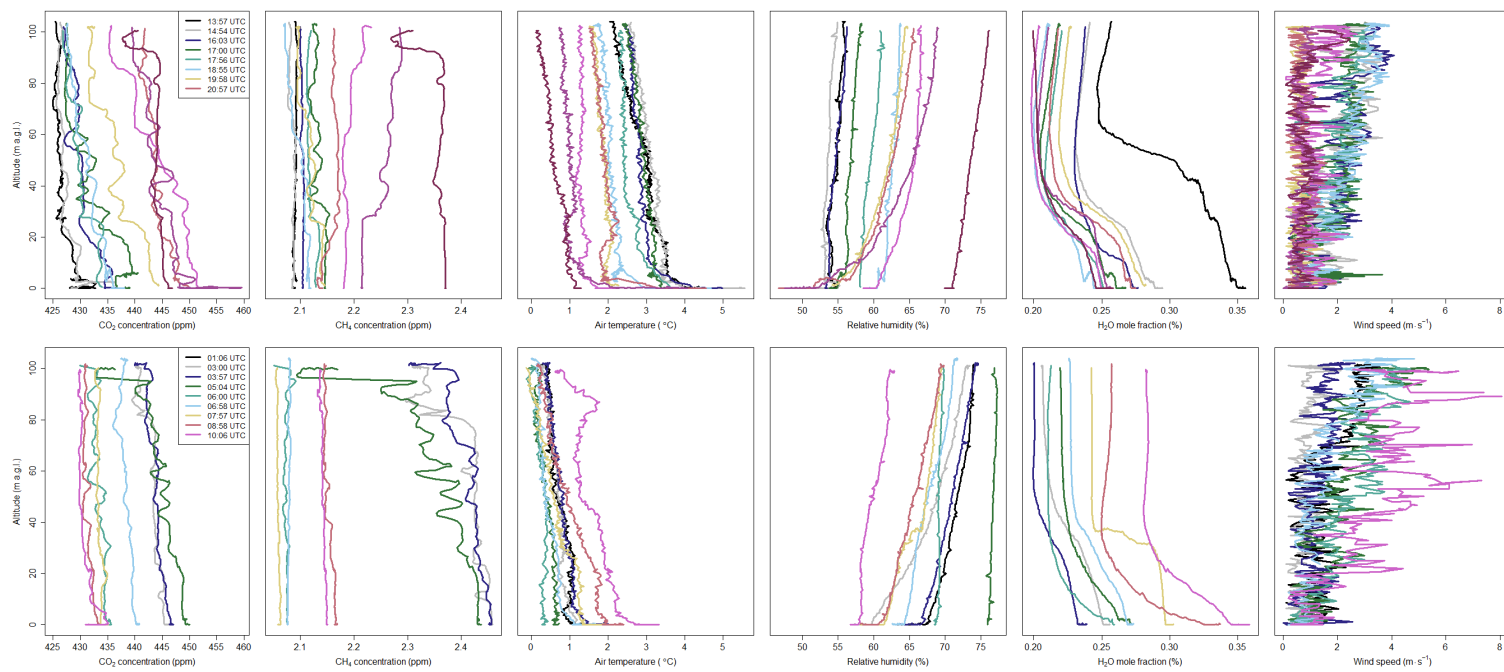
Figure S25. Vertical profiles of CO_2, CH_4, air temperature, relative humidity, H_2O and wind speed on 31.01-1.02.2022 - campaign 11.
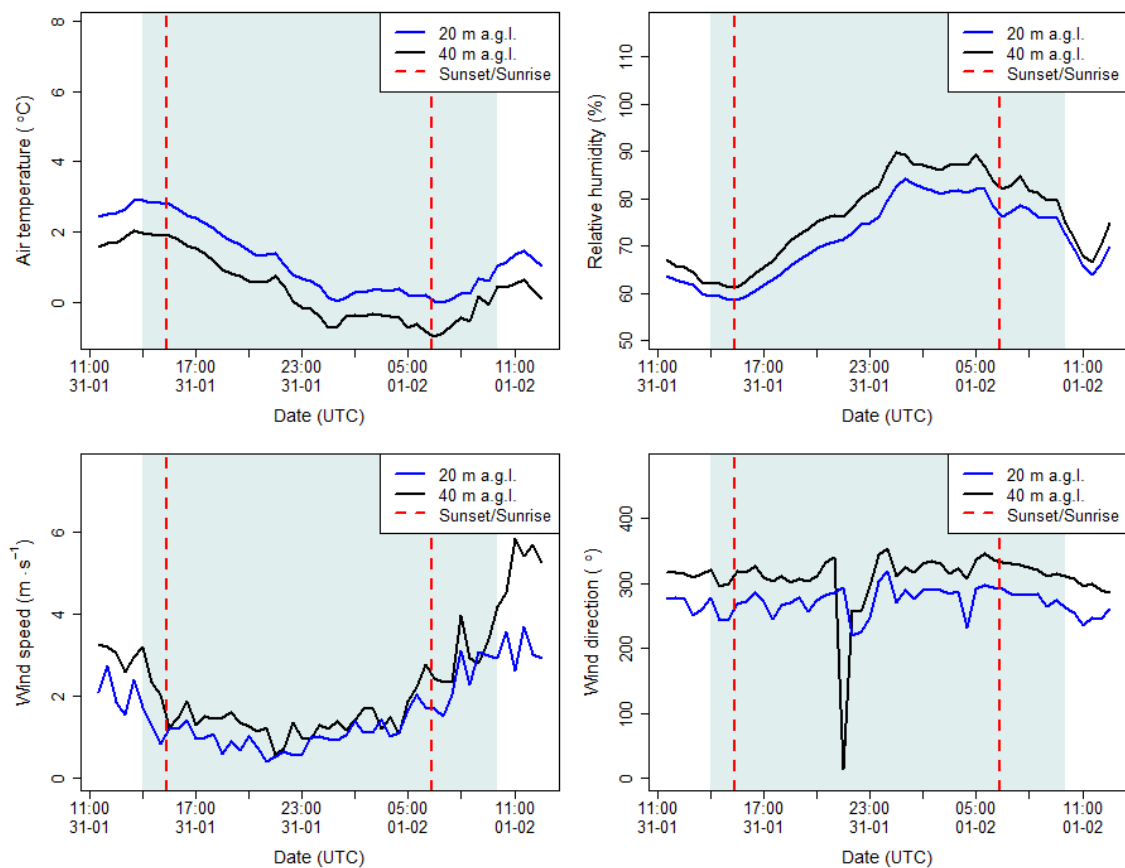
Figure S26. Time courses of air temperature, relative humidity, wind speed and wind direction at two altitudes (20 and 40 m a.g.l.) from measurement point at Reymonta St. on 31.01-1.02.2022 - campaign 11. Azure background presents campaign duration.