Contribution of the advection term for NEE in short-statured ecosystems

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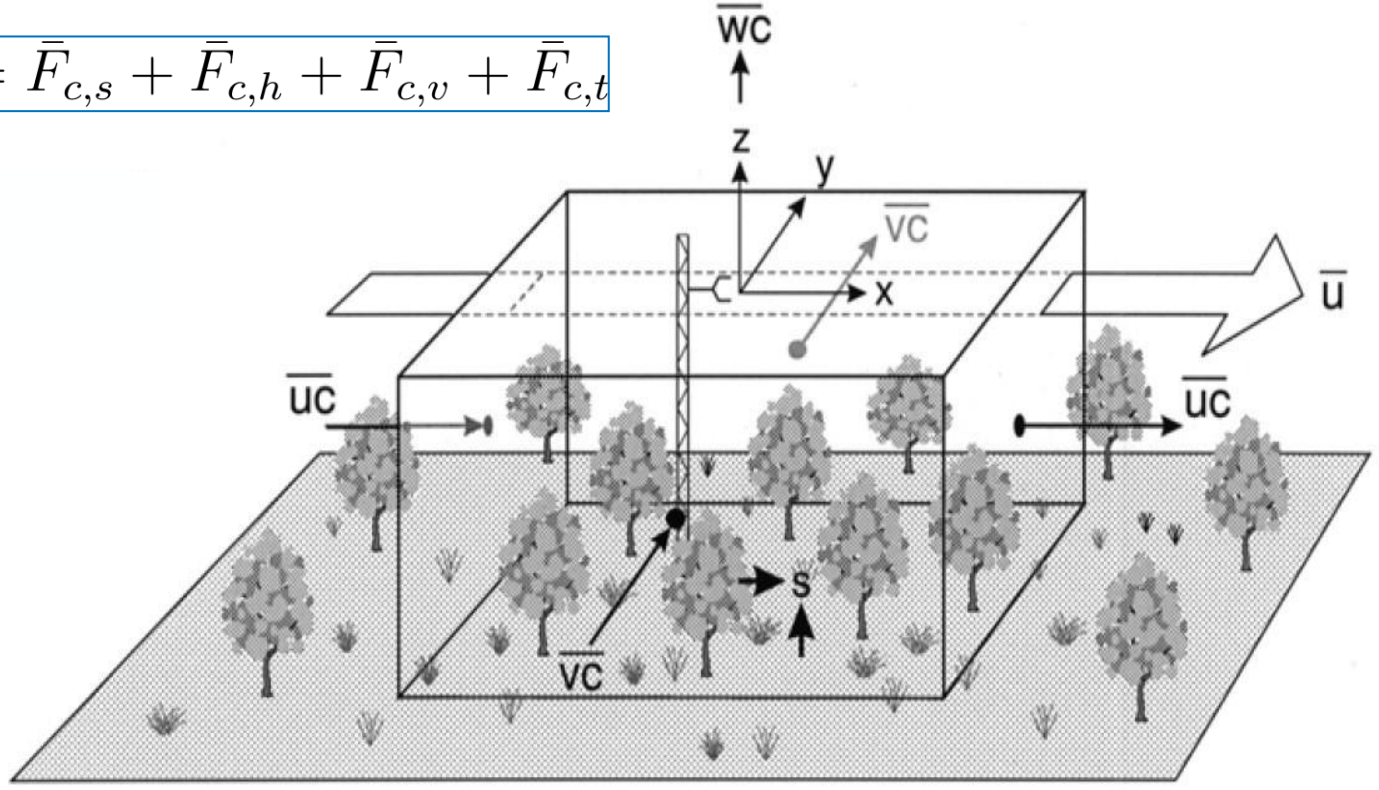
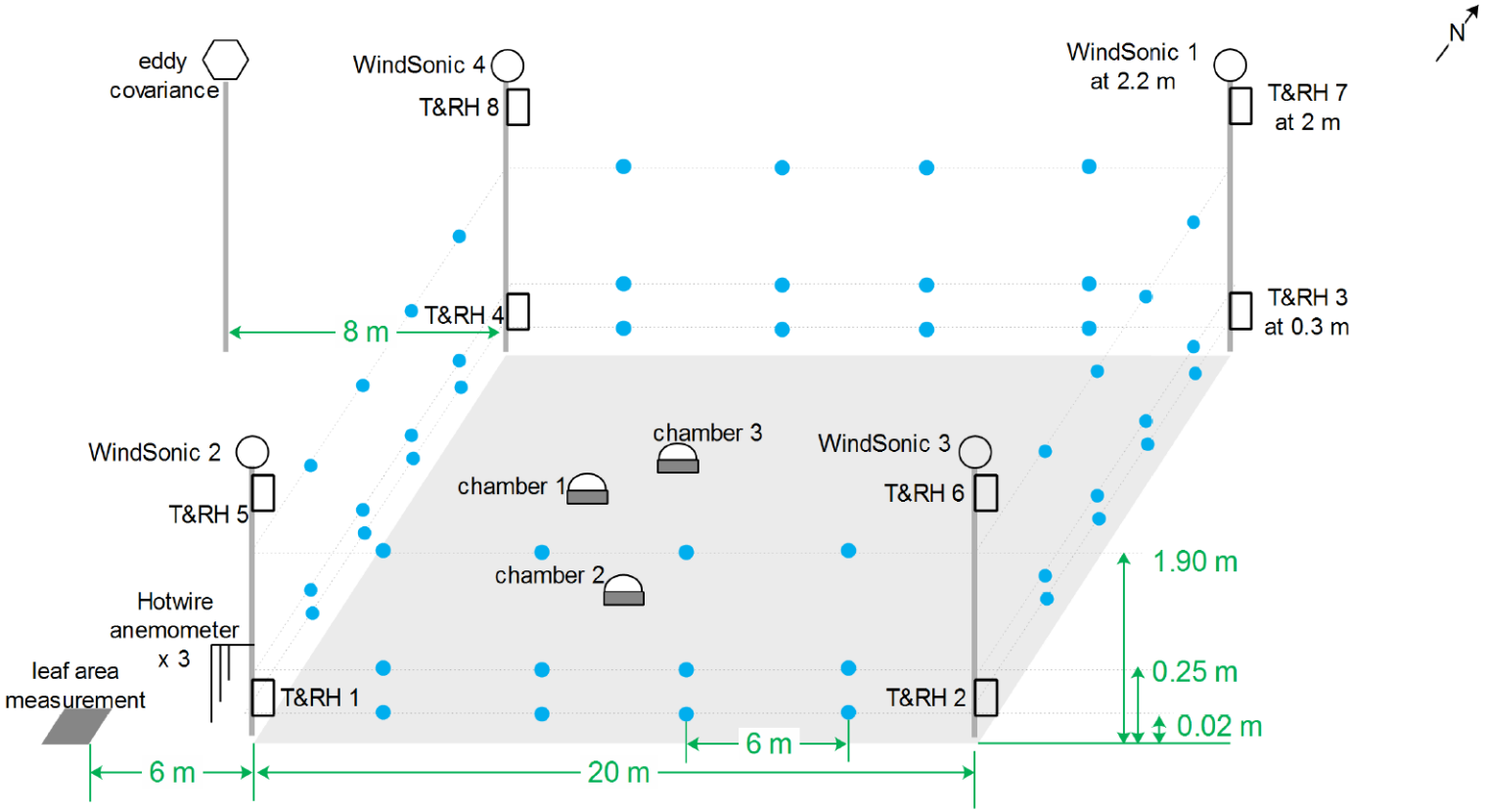
Concept

$$\overline{F_c} = \bar{F}_{c,s} + \bar{F}_{c,h} + \bar{F}_{c,v} + \bar{F}_{c,t}$$



Finnigan *et al.*, 2003

Setup

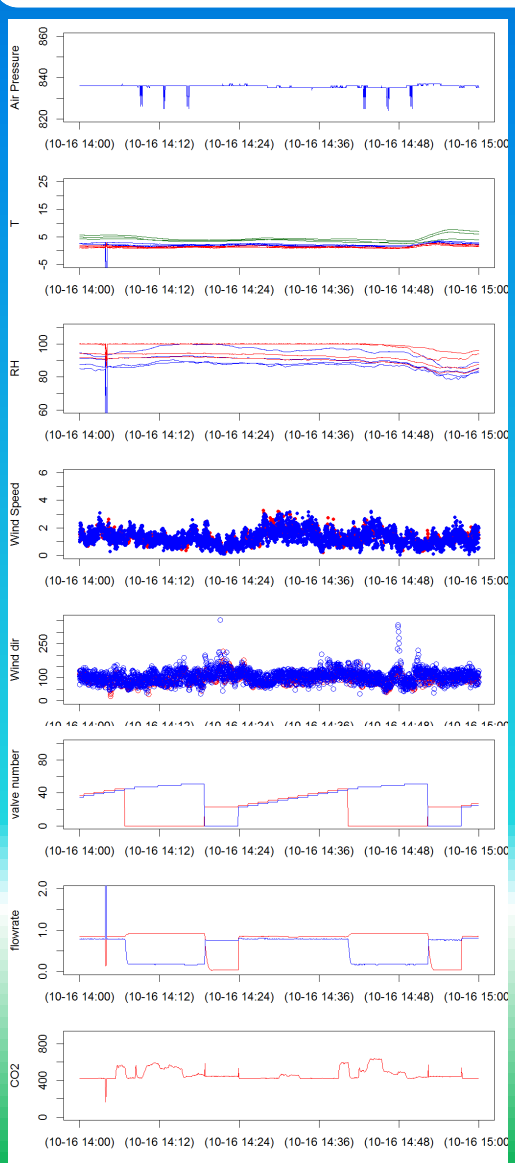

N
eddy covariance
WindSonic 4
T&RH 8
WindSonic 1 at 2.2 m
T&RH 7 at 2 m
8 m
T&RH 4
T&RH 3 at 0.3 m
WindSonic 2
T&RH 5
chamber 3
chamber 1
WindSonic 3
T&RH 6
chamber 2
1.90 m
Hotwire anemometer x 3
leaf area measurement
T&RH 1
T&RH 2
0.25 m
0.02 m
6 m
6 m
20 m

Field campaign 2015

Field campaign 2015

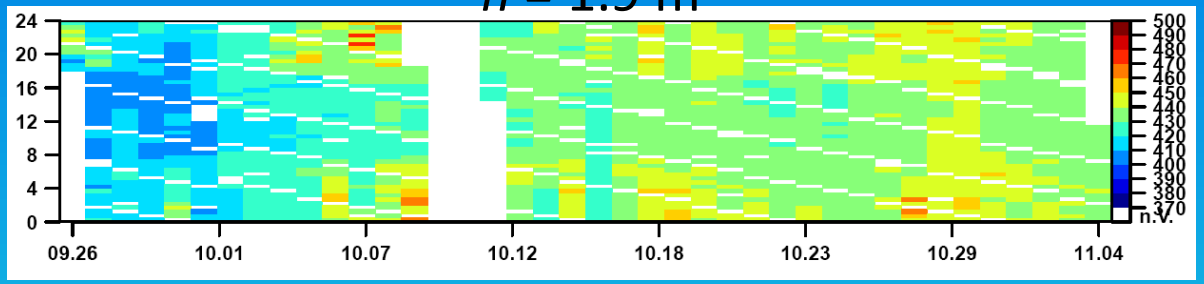
Monte Bondone, 2015

Raw data

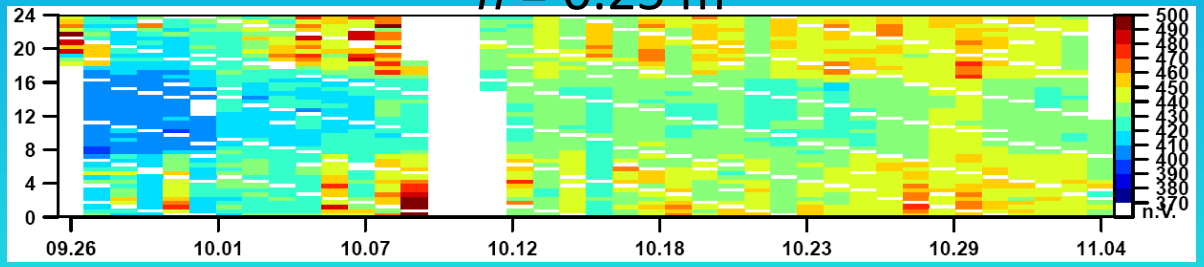


CO_2 concentration (in ppm)

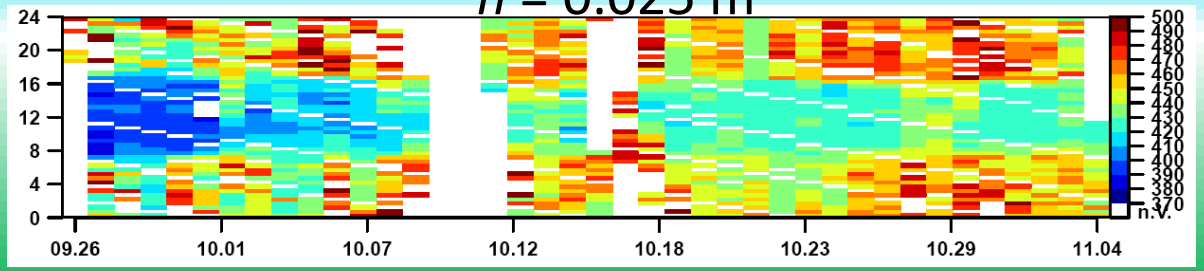
h = 1.9 m



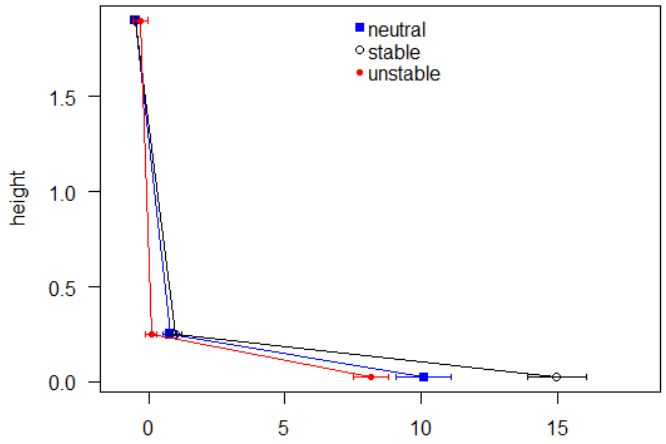
h = 0.25 m

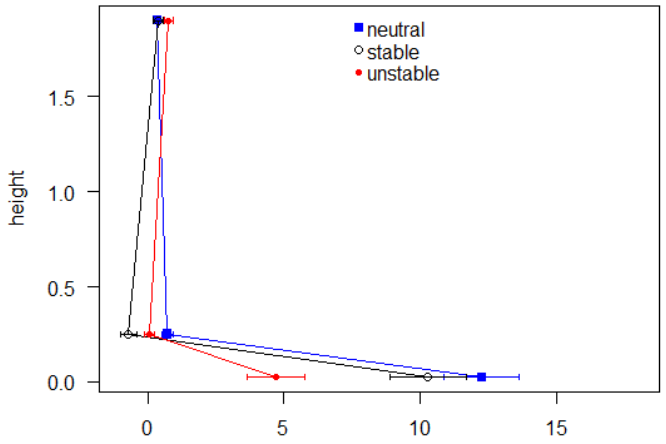


h = 0.025 m

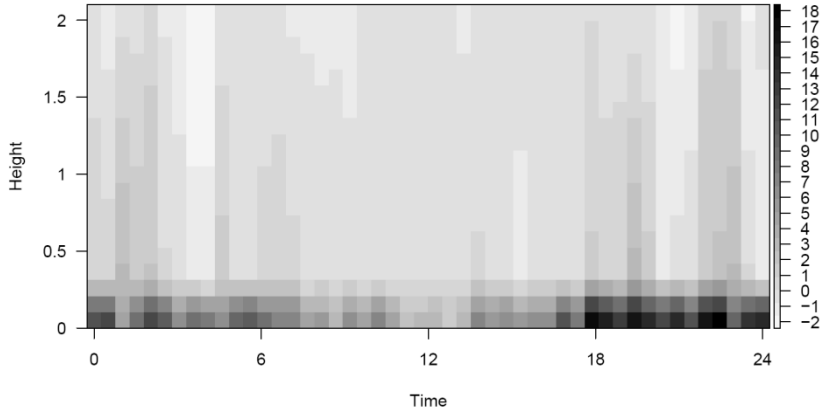


Results: CO_2 profiles

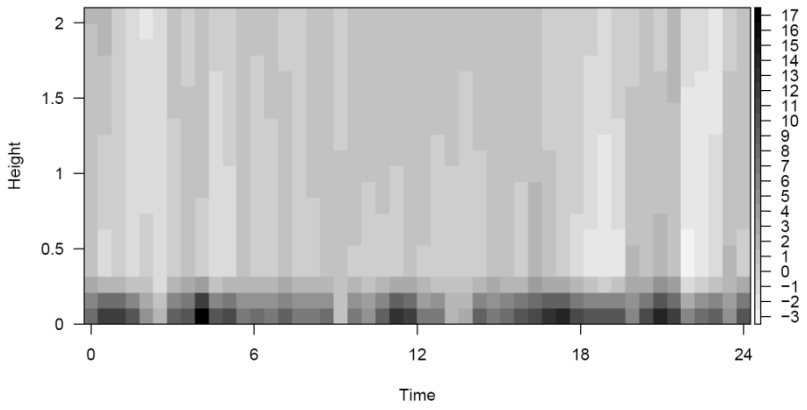




Difference in CO_2 concentration (south – north, ppm)

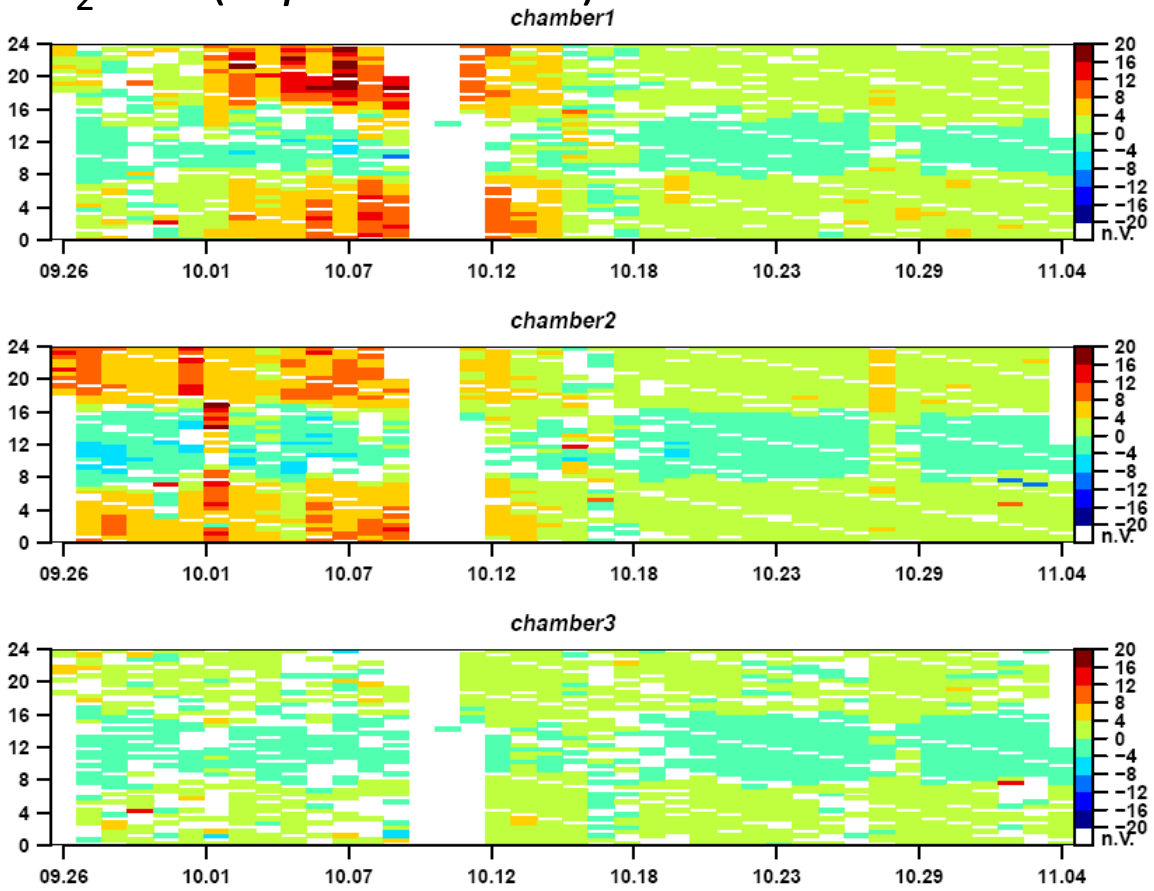


Difference in CO_2 concentration (east – west, ppm)

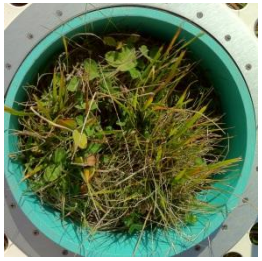


Results: chambers

CO_2 flux (in μmol m^{-2} s^{-1})



Dry weight

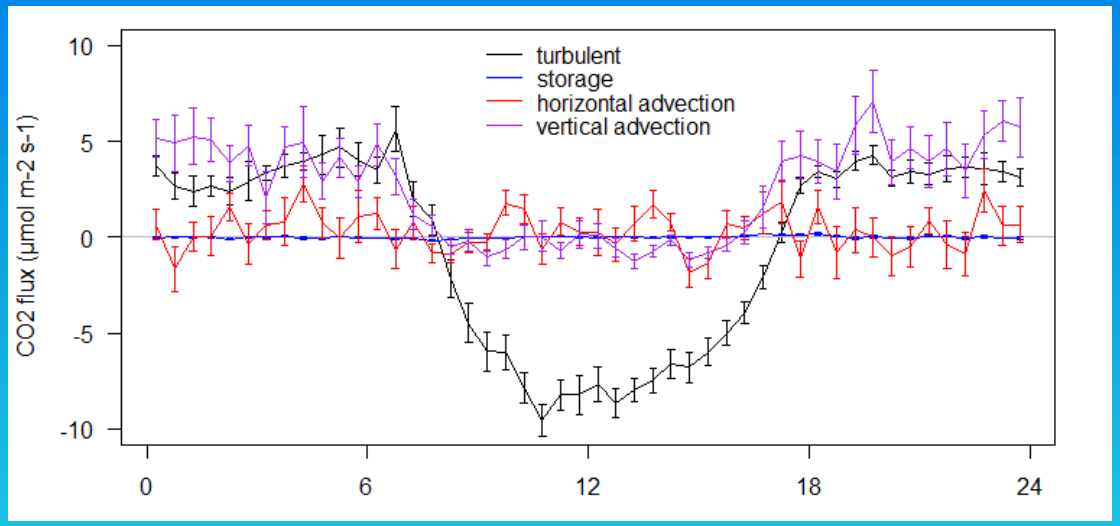


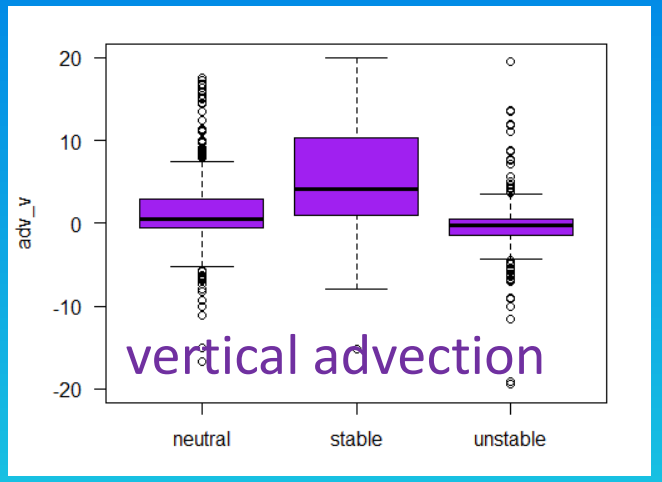
13.4 g

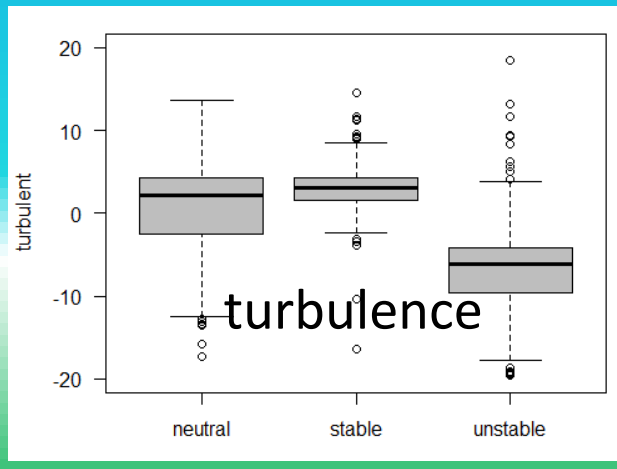
11.7 g

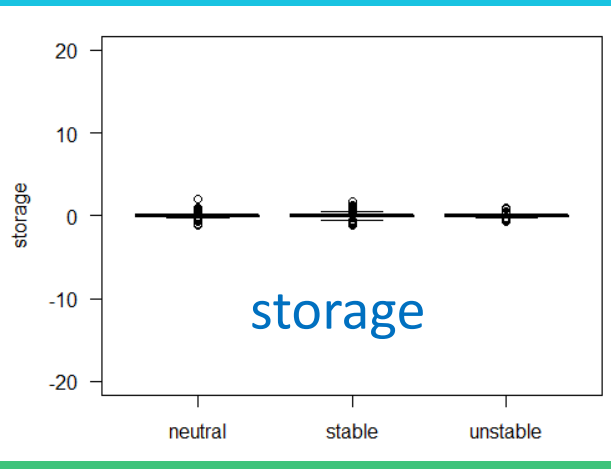
10.8 g

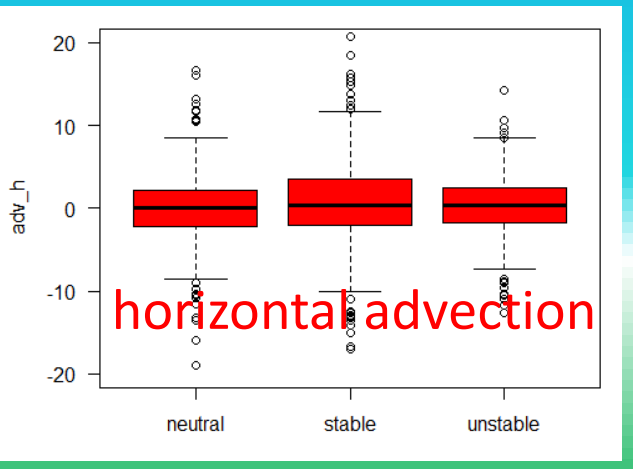
Results: Flux terms



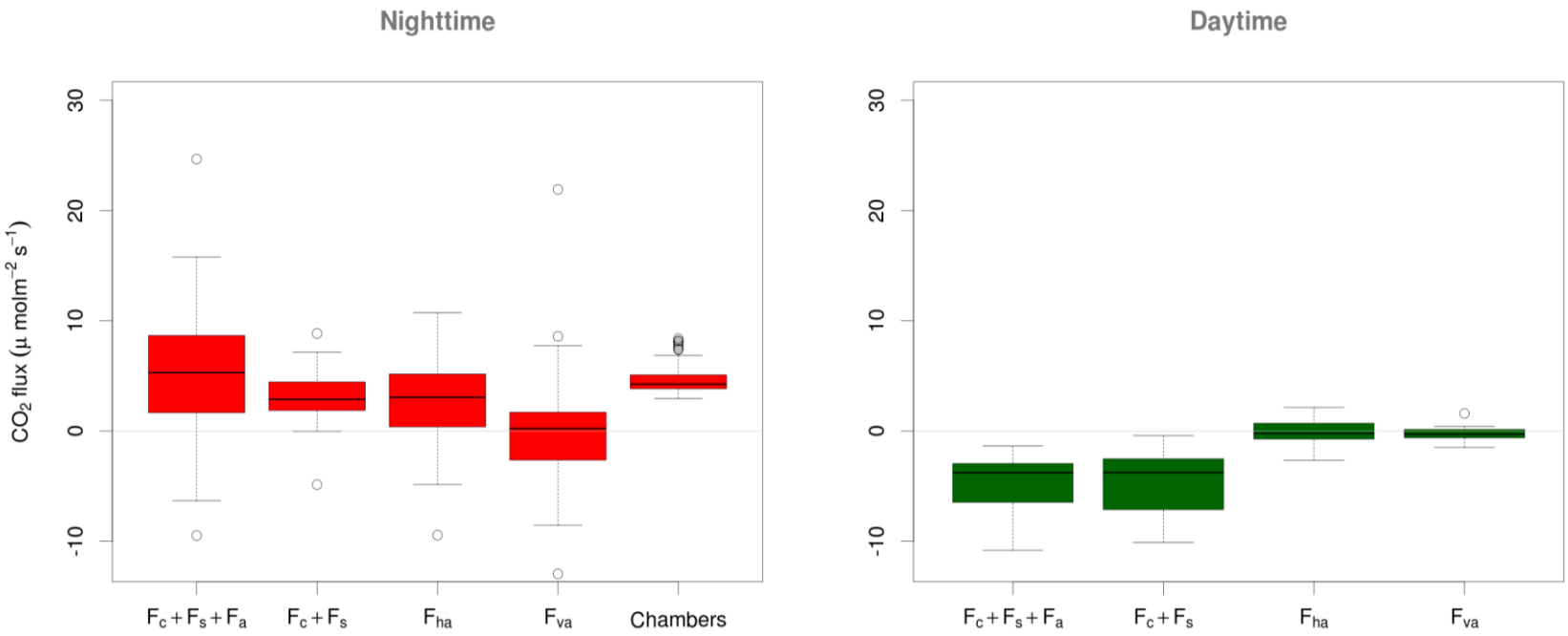






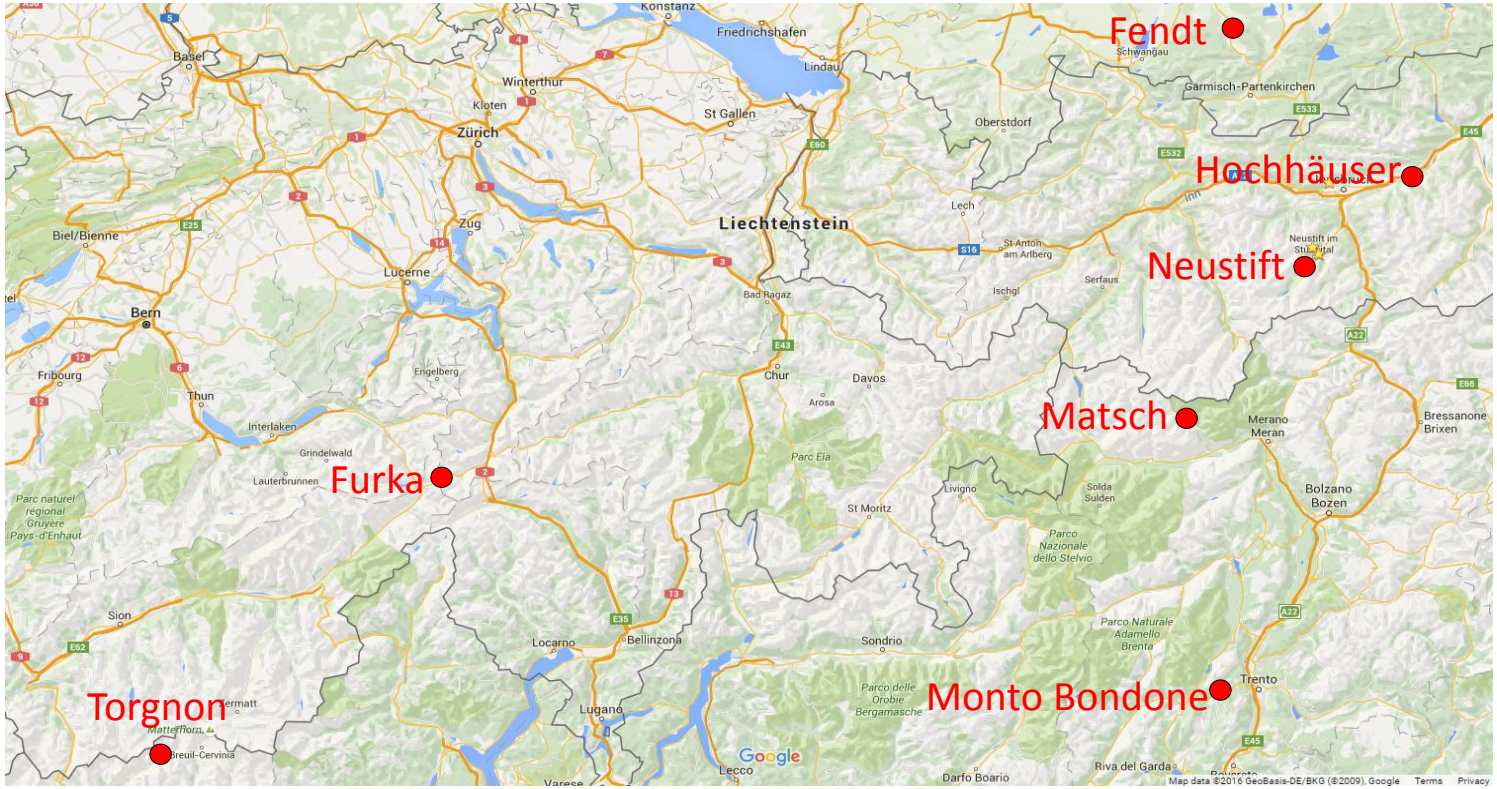


Results 2012



Torgnon, 2012

Future plan



- Different topography
- Different scales


$F_c = F_{c,s} + F_{c,t} + F_{c,v} + F_{c,h}$
Thank you for your attention