Flux-profile relationships and mesoscale circulations

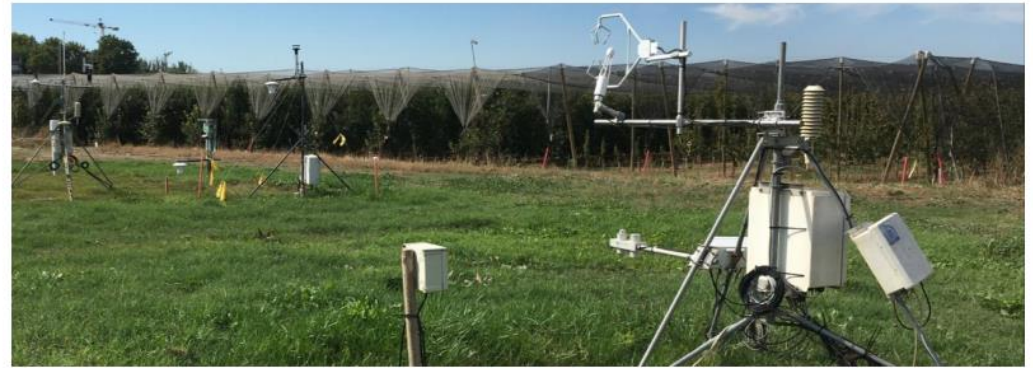**B. Marti**

Flux-profile relationships and mesoscale circulations

B. Martí, A. Grau, D. Martínez-Villagrasa, MA. Jiménez, J.Cuxart

Research topics:
- Flux-gradient relationships over a variety of surfaces
- Comparison of EC and lysimeter ET (IRTA, Els Plans)
- Nocturnal ET and condensation
- Basin flows, including Marinada (aka sea-breeze)
- Effect of Marinada on the nocturnal ABL
- LIAISE-extension: fog, dew/frost, SBL, SEB during dry-out

Flux-profile relationships

B. Martí et al. (BLM 2021 submitted)

Fluxes estimation tested with z/L and Rib in complex terrain (bottom of a valley)

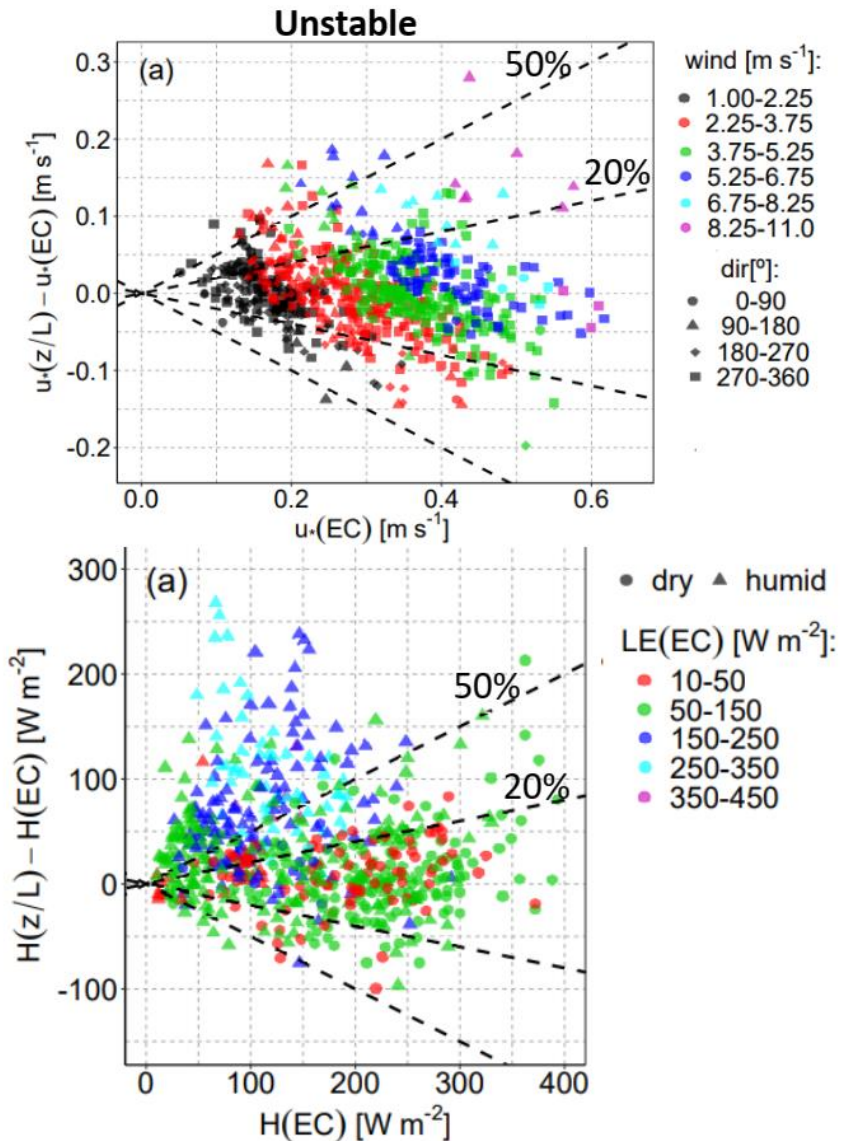$$\frac{H}{\rho c_p} = -\frac{\kappa u_* z}{\phi_h} \frac{\partial \bar{\theta}_v}{\partial z}$$

Daytime:

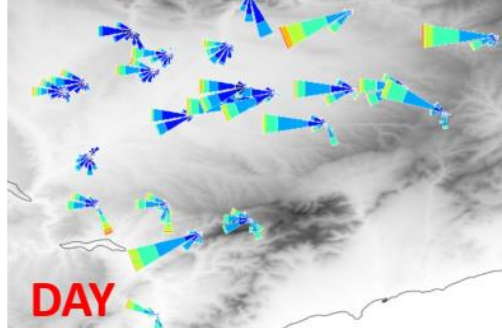u_* is well characterized

H (dry)→ well represented

H(humid)→ overestimated

         with high LE(EC)

         and high Rsw
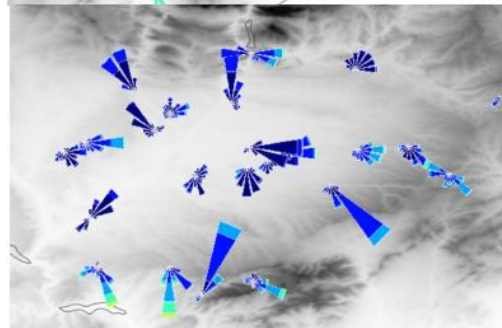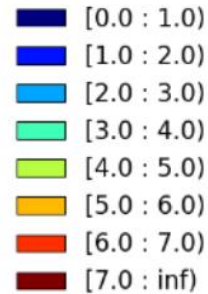
- Future calculation for LIAISE's database including LE

Grau et al, 2021, submitted

DAY

NIGHT

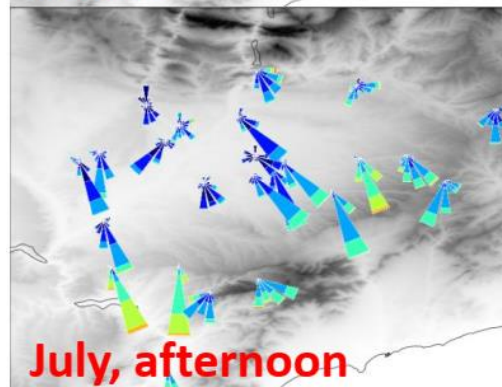**July, afternoon**

Wind Speed (ms^{-1})

- [0.0 : 1.0)
- [1.0 : 2.0)
- [2.0 : 3.0)
- [3.0 : 4.0)
- [4.0 : 5.0)
- [5.0 : 6.0)
- [6.0 : 7.0)
- [7.0 : inf)

- Up/down river
- Up/down slope
- Marinada
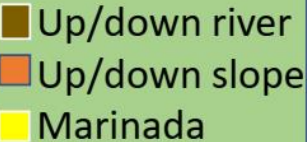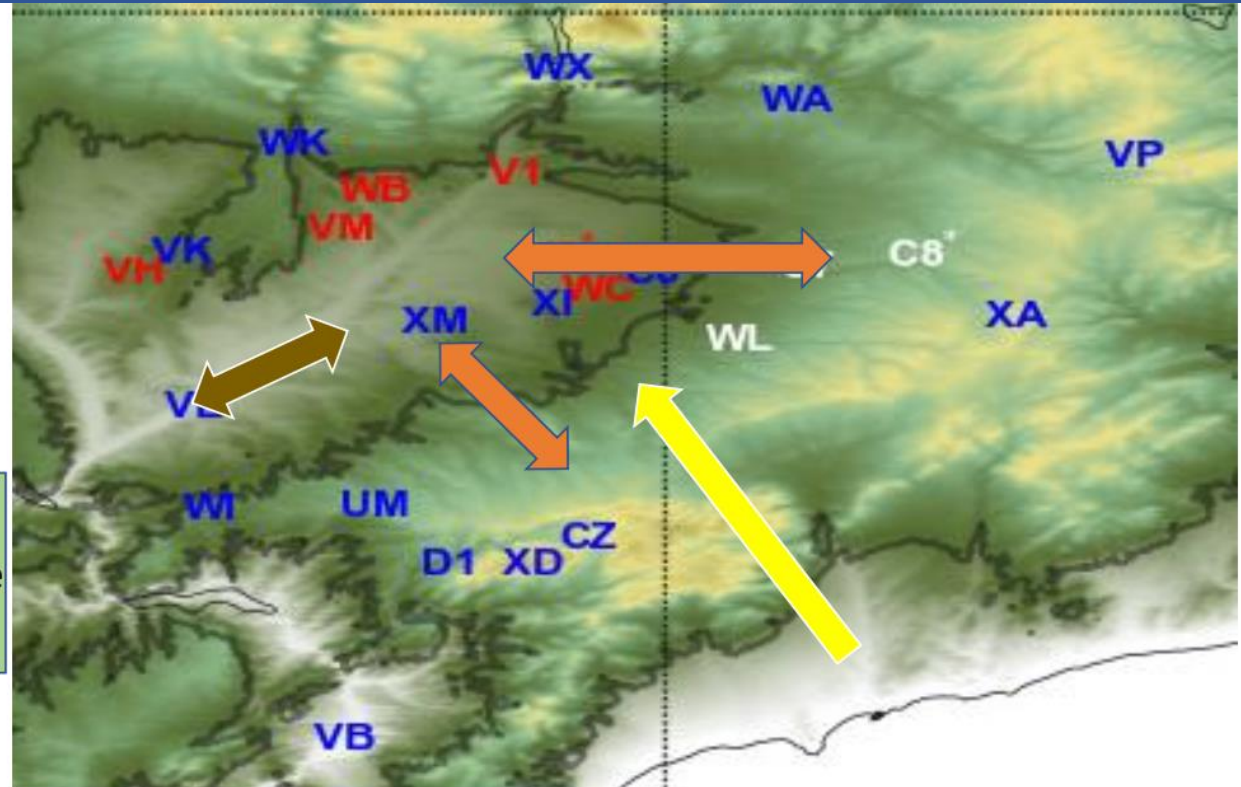
Mesoscale Simulations (anticiclonic, clear-sky)

✓ **Characterize locally-driven winds** (their interaction and influence of surface features)

✓ How realistic are the simulations? **Validation using LIAISE observations**

✓ Sensitivity tests, which are the most **important model parameters**?