



Comparison between theoretical footprint models and experimental measurements of intra-field spatial variability scalar fluxes over different sites

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Not many experimental data about intra-field spatial variability of scalar flux densities are presented in literature. In this work theoretical footprint models and experimental intra-field turbulent fluxes of latent, sensible heat and CO₂ were compared. The experimental data were obtained using a mobile eddy covariance station moving it from a discontinuity point, represented by the field edge, to the centre of the field where a fixed eddy covariance station was placed. The experimental fields were in Landriano (PV) in the Po Valley, Italy and Barrax (Albacete) in Spain. Simple analytical footprint models that describe the representative source area for turbulent fluxes were compared with the experimental data. Mathematical relationship between footprint models and gamma function was explained. Energy balance closure was calculated starting from fixed tower measurements. Aerodynamic roughness and gamma distribution parameters were estimated for these specific fields.