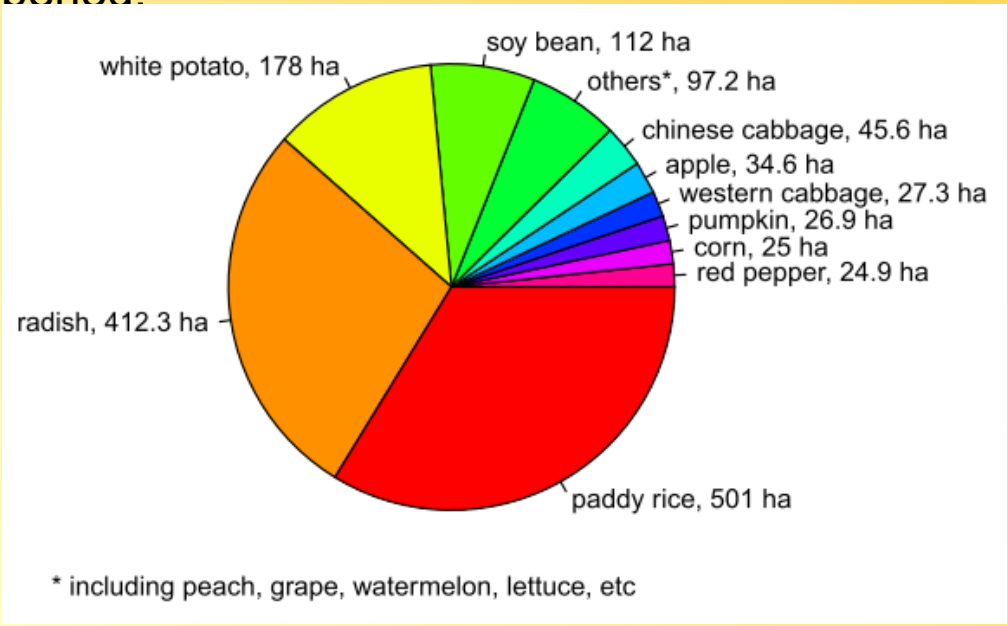
Dynamics of CO_2 exchange in croplands in Haean Catchment, South Korea

Peng Zhao, Johannes Lüers
peng.zhao@uni-bayreuth.de, johannes.lueers@uni-bayreuth.de

Aims

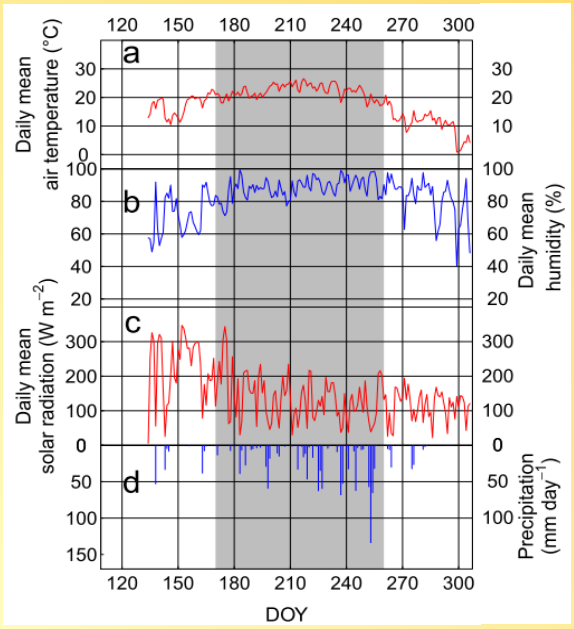
- To obtain reliable information about the net ecosystem exchange of CO_2 between the surface and the air in typical (both irrigated and non-irrigated) croplands in South Korea.
- To better understand the dynamics of agro-ecosystem CO_2 exchange during the whole growing period.

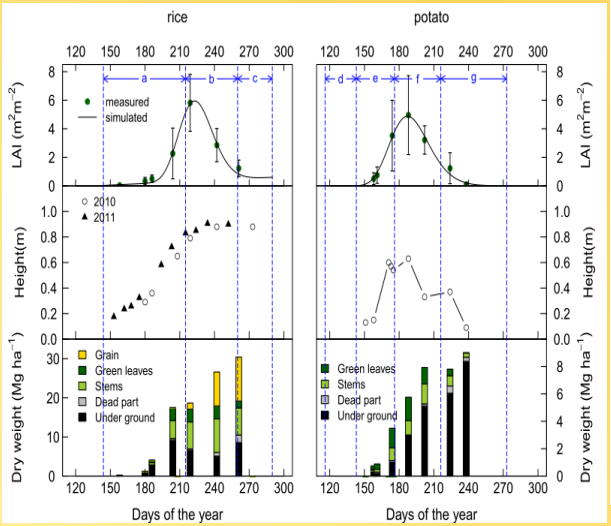


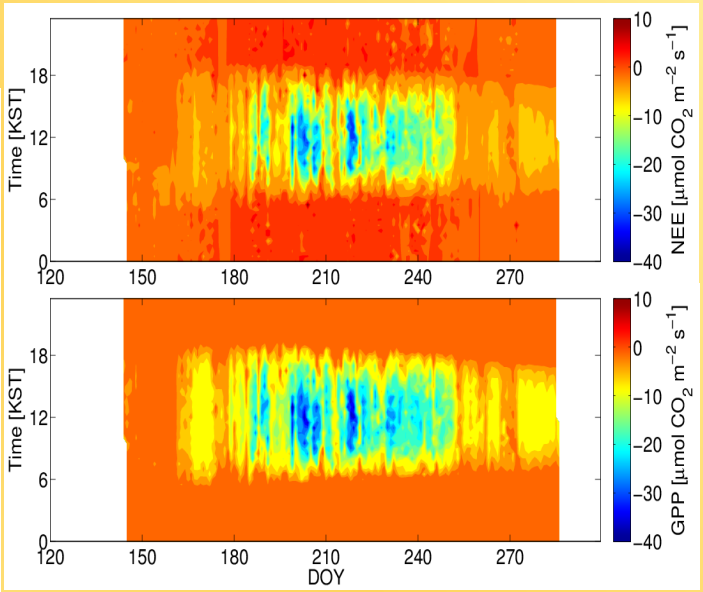
Weather stations

Biomass measurement

Eddy-covariance



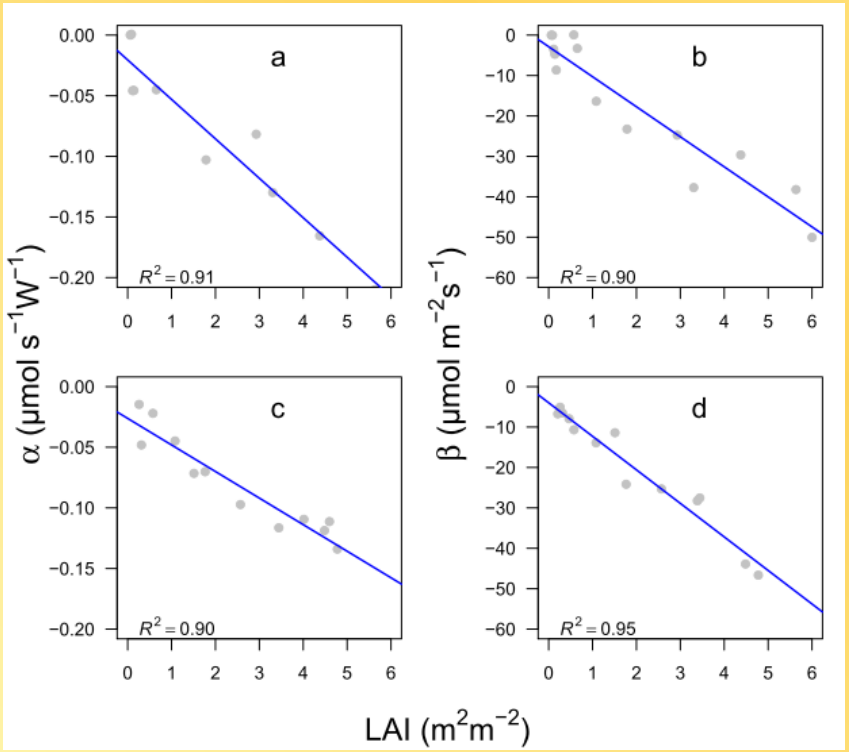


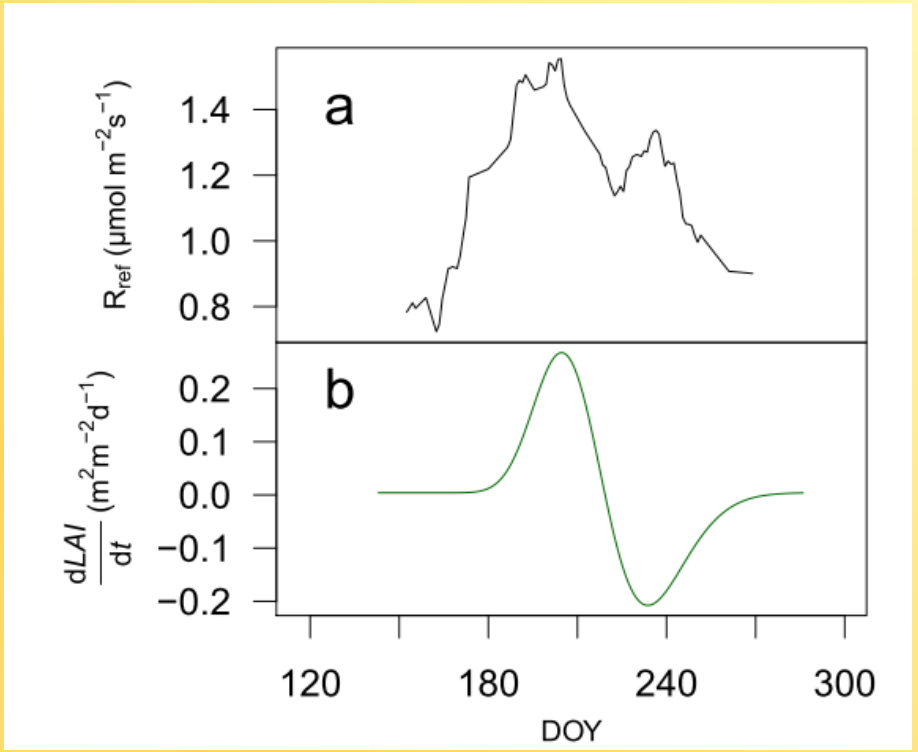


Biomass & Light

$$\mathrm{NEE} = \frac{\alpha R_g \beta}{\alpha R_g + \beta} + R_{eco}$$

$$R_{eco} = R_{ref} e^{E_0\left(\frac{1}{T_{ref}-T_0} - \frac{1}{T-T_0}\right)}$$

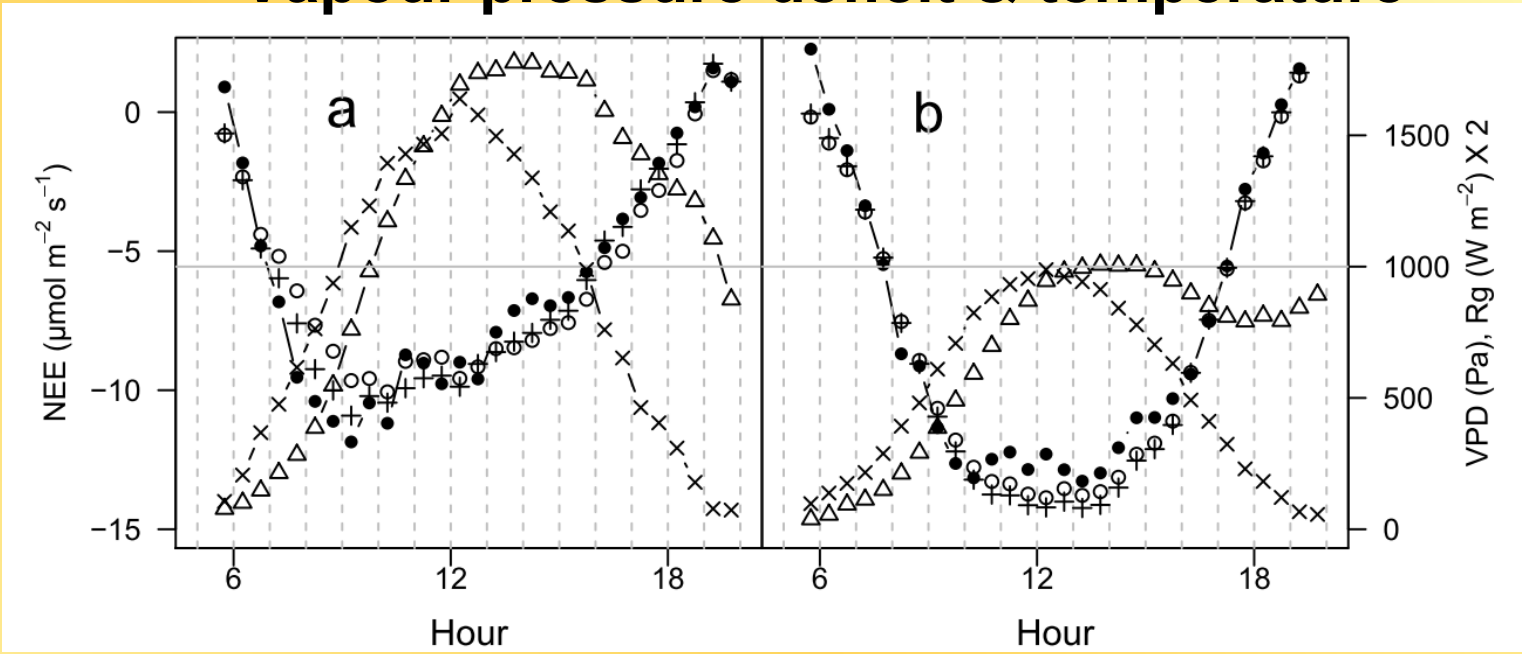


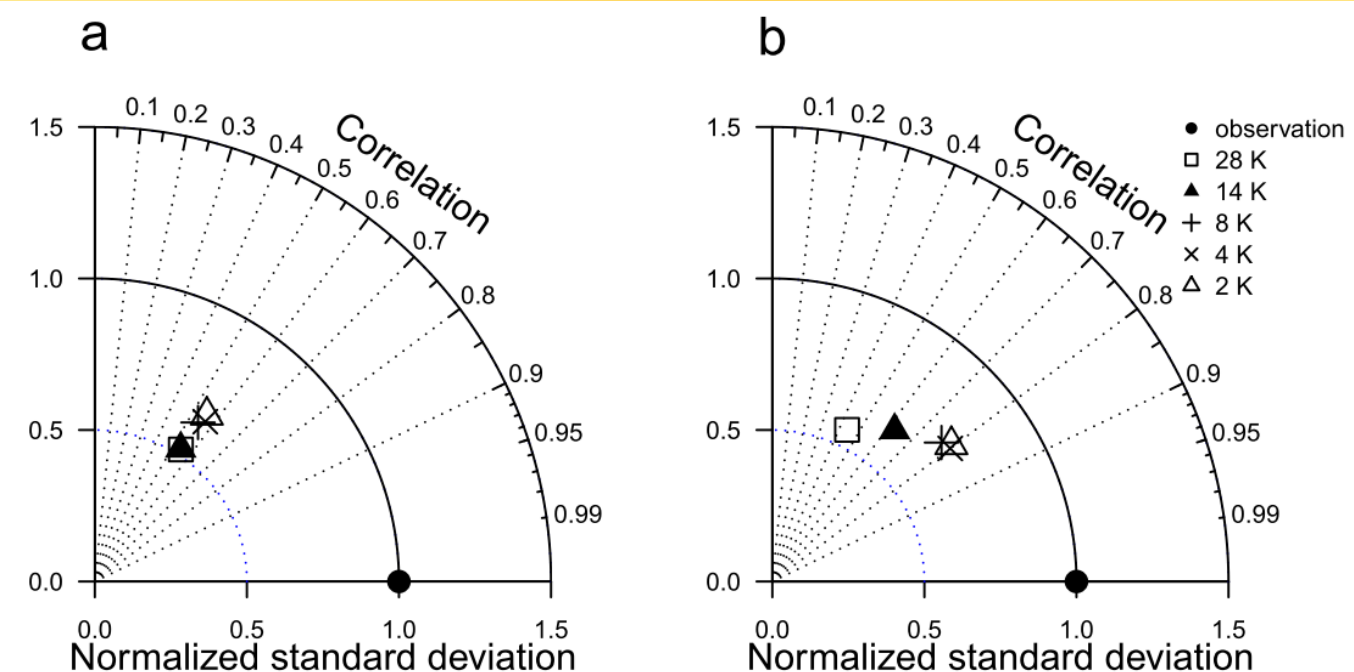


$$\frac{\mathrm{GPP}}{\mathrm{LAI}} = \frac{\alpha' R_g \beta'}{\alpha' R_g + \beta}$$

	clear		cloudy	
	α'	β'	α'	β'
rice	-0.024	-8.8	-0.029	-11.2
potato	-0.040	-15.2	-0.040	-15.5

Vapour pressure deficit & temperature





References

- Zhao, P. and Lüers, J., Biogeosciences Discuss., 9(3), 2883–2919, doi:10.5194/bgd-9-2883-2012, 2012.
- Zhao, P., Lüers, J., Olesch, J., Foken, T.. Arbeitsergebnisse 45. ISSN 1614-891, 2011

Acknowledgment

This study was carried out as part of the International Research Training Group TERRECO (GRK 1565/1) funded by the Deutsche Forschungsgemeinschaft (DFG) at the University of Bayreuth, Germany and the Korean Research Foundation (KRF) at Kangwon National University, Chuncheon, S. Korea.