

Data comparison between Meiliangwan (MLW) and Dapukou (DPK) in Lake Taihu

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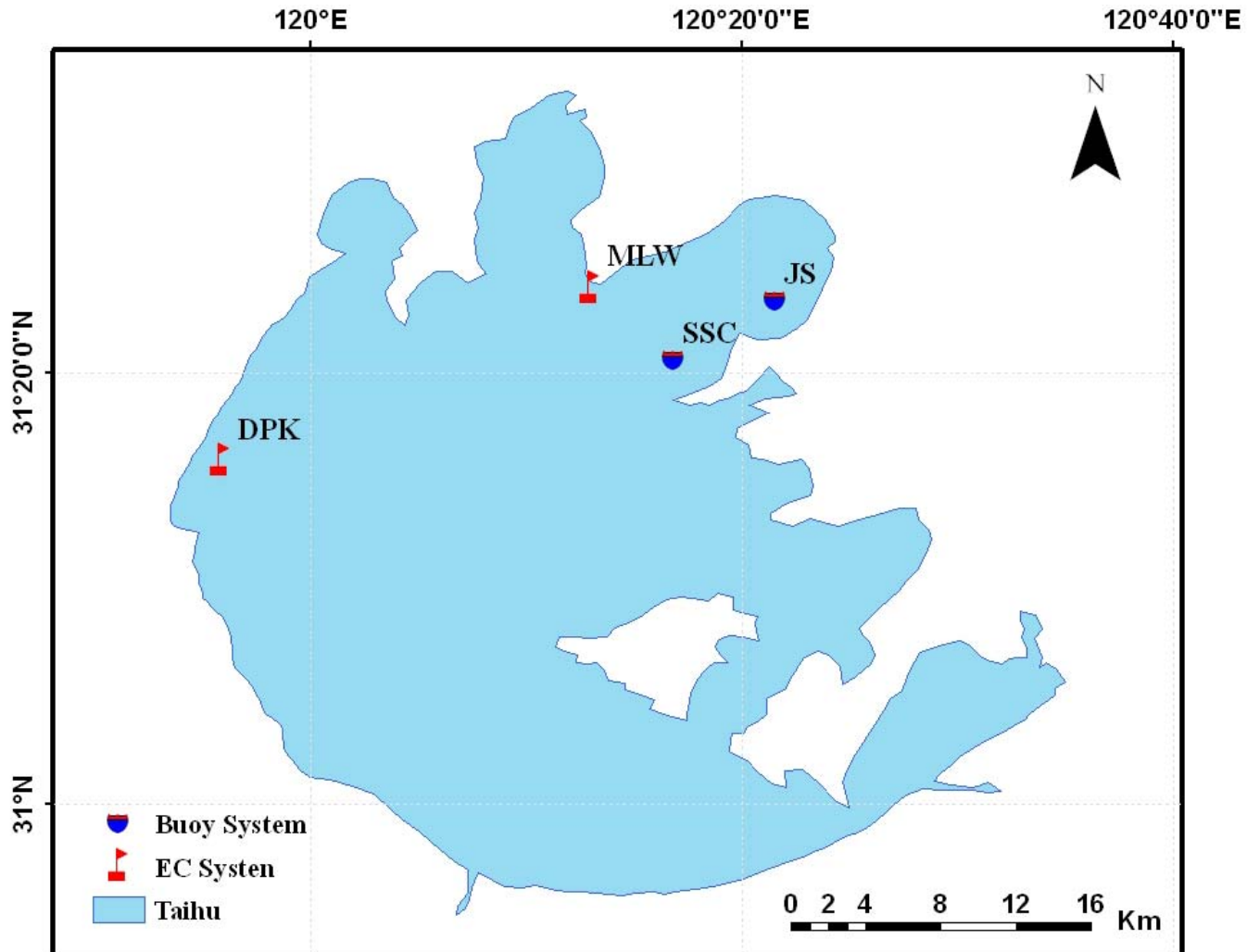
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Outline

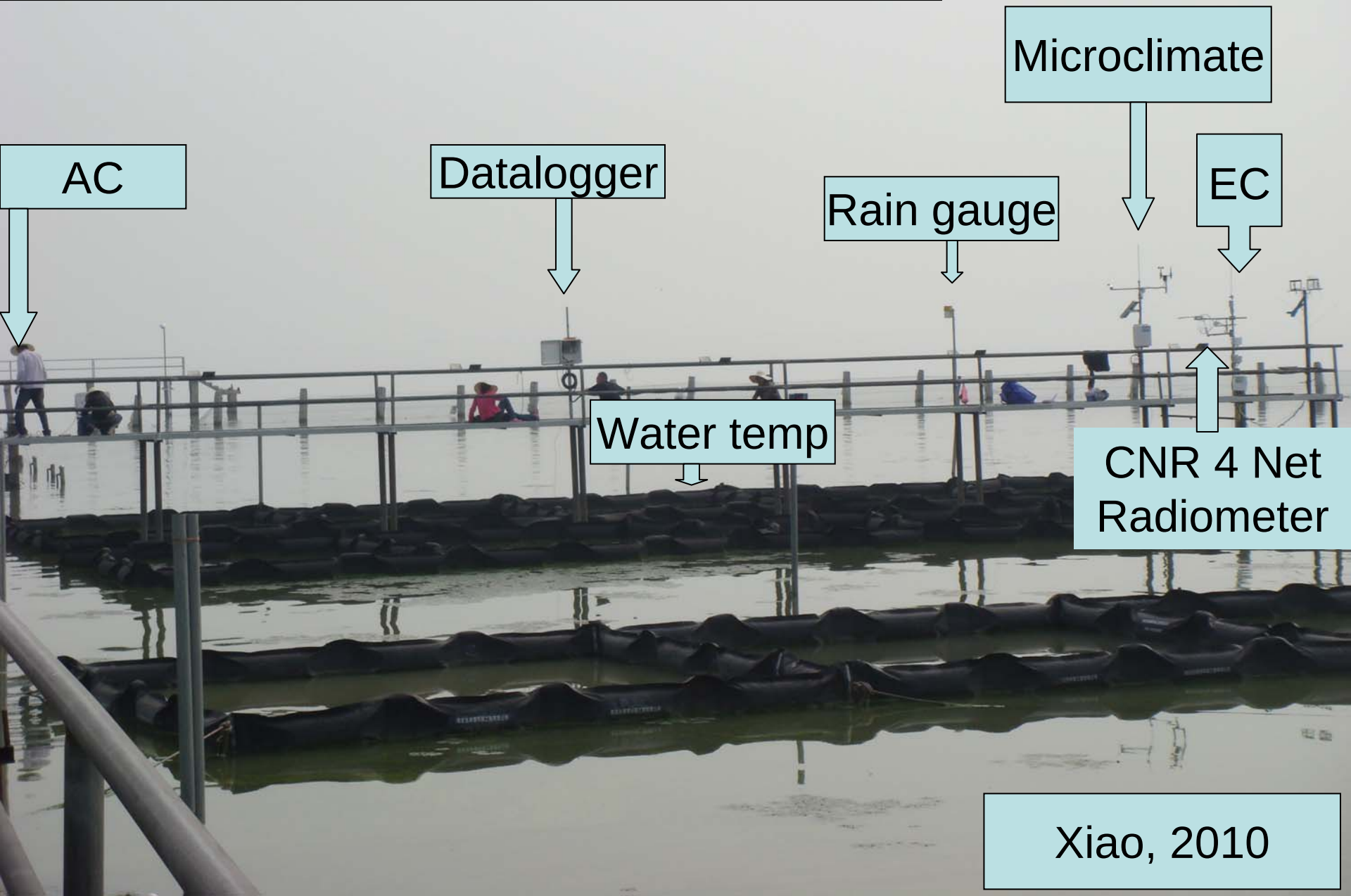
1. Background
2. Data
3. Comparison analysis
4. Conclusion
5. Discussion



1. Background



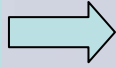
EC and microclimate measurement at MLW



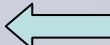
Xiao, 2010

EC and microclimate measurement at DPK

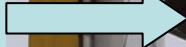
Wind Speed
and Direction



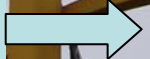
Temp and
Humidity



Rain
Gauge



Data
Logger



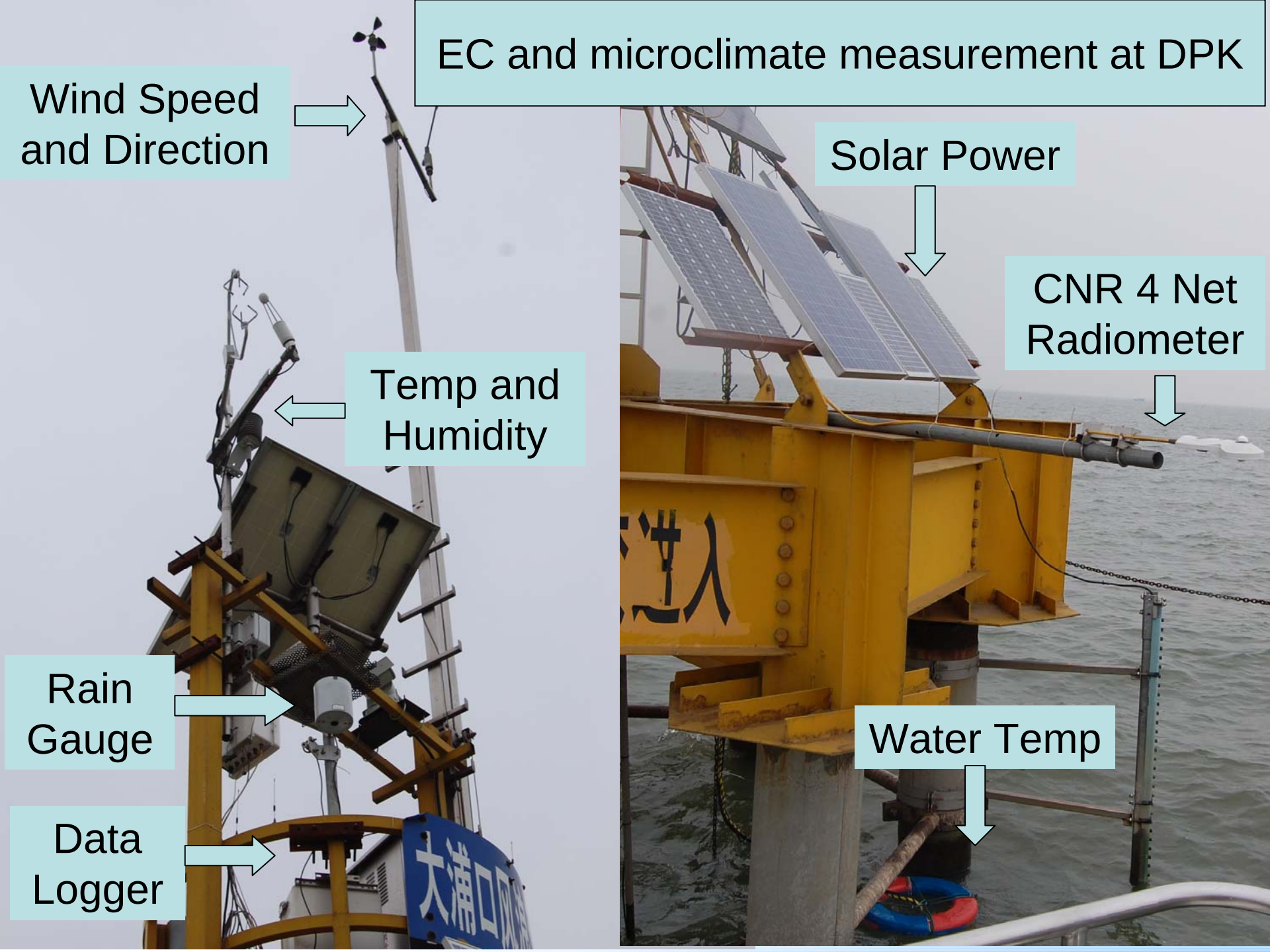
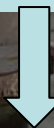
Solar Power



CNR 4 Net
Radiometer



Water Temp



2. Data

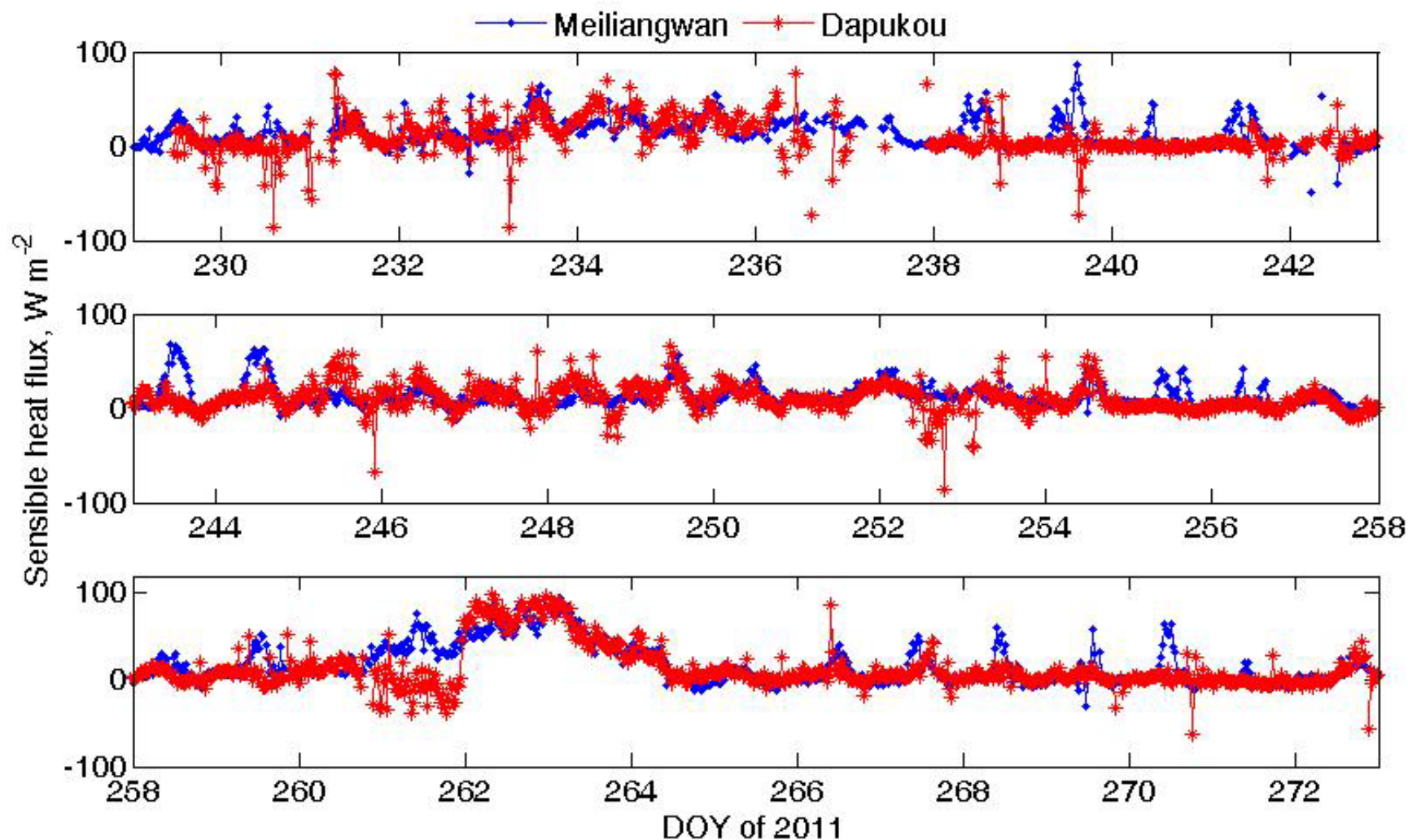
	MLW	DPK
Eddy Covariance measurement	June 13, 2010~now	August 17, 2011~now
Meteorological measurement	June 13, 2010~now	August 17, 2011~now
Net radiation measurement	June 13, 2010~now	December 4, 2010~now
Water temperature measurement	June 13, 2010~now	August 17, 2011~now



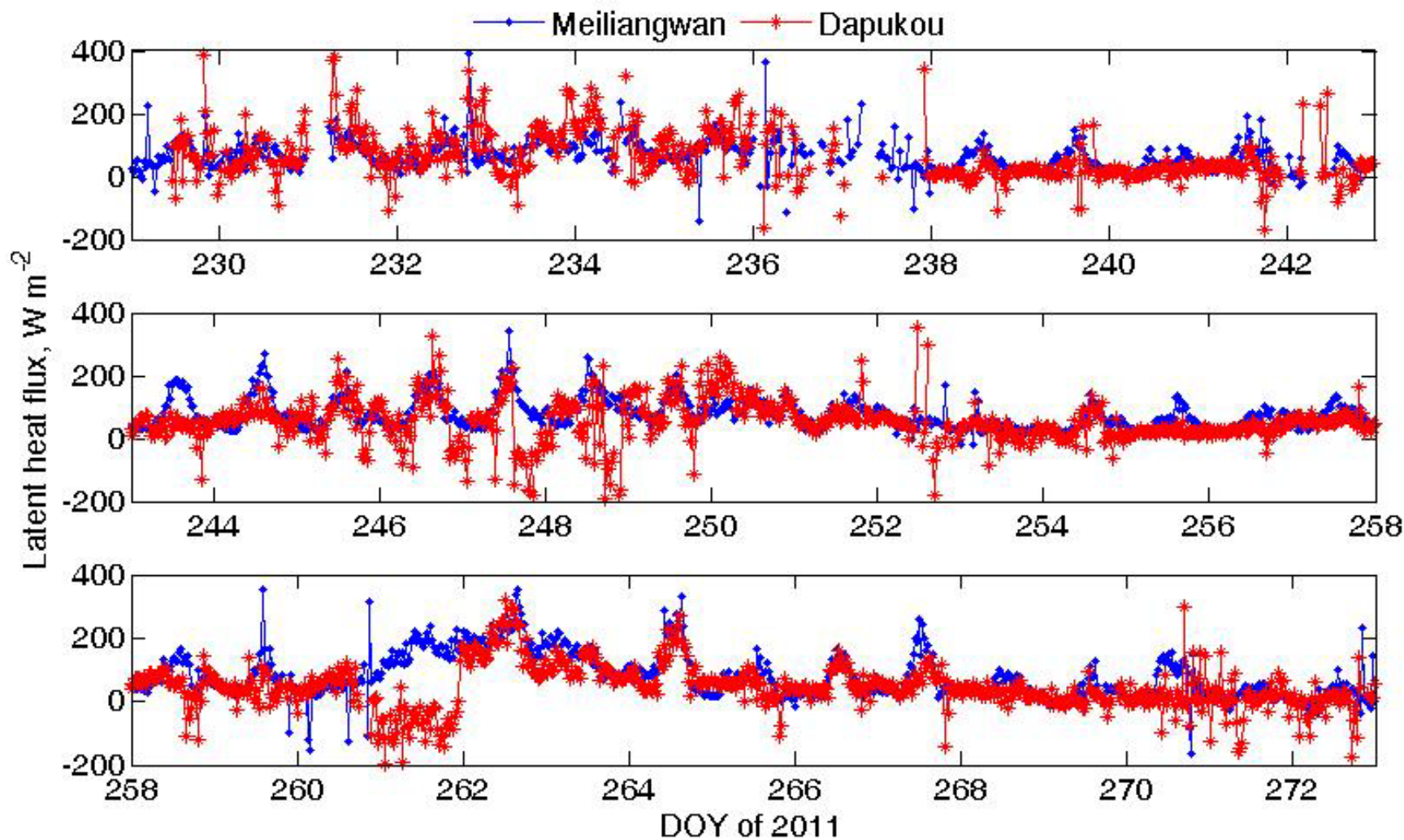
3. Comparison analysis



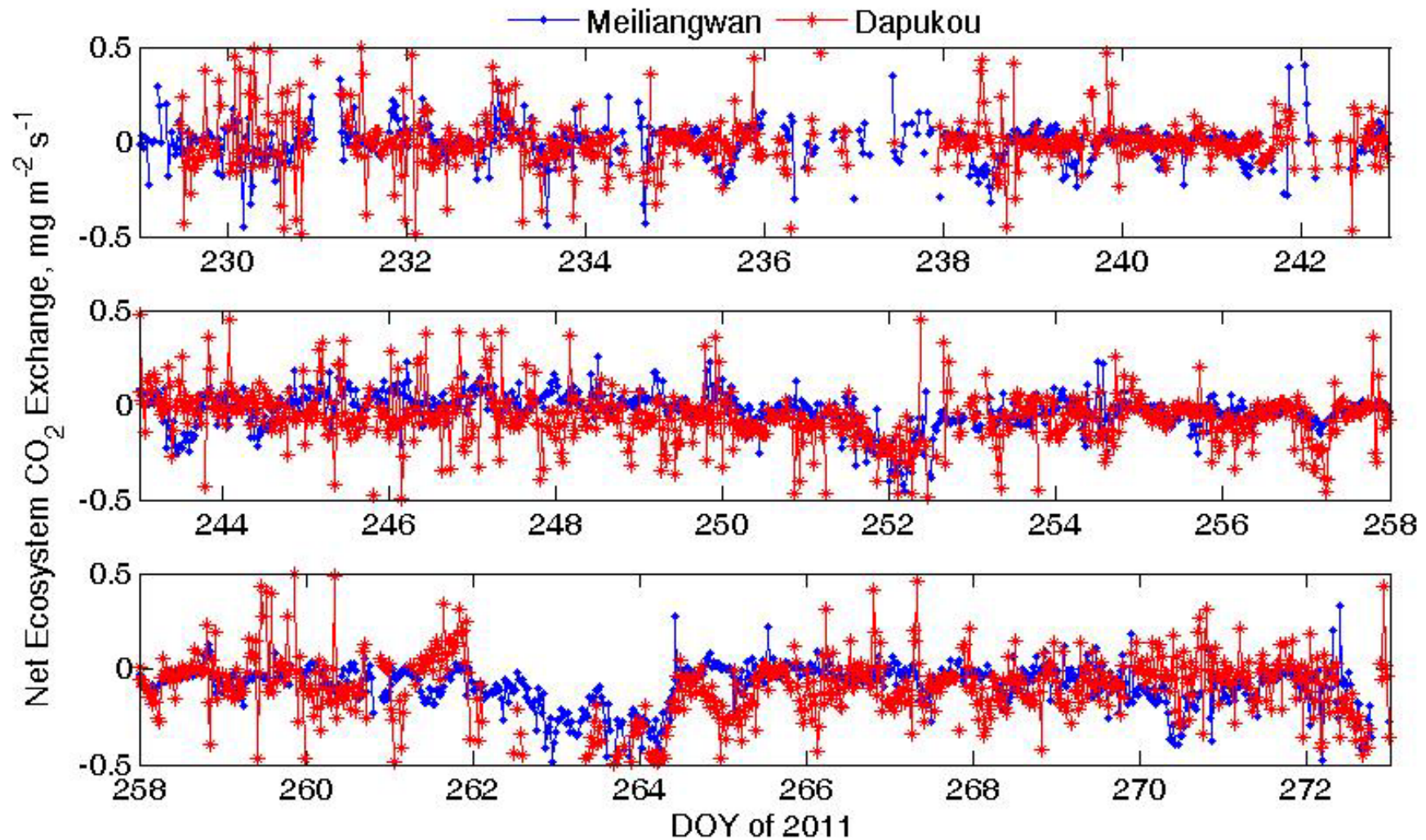
Eddy Covariance-Sensible heat flux



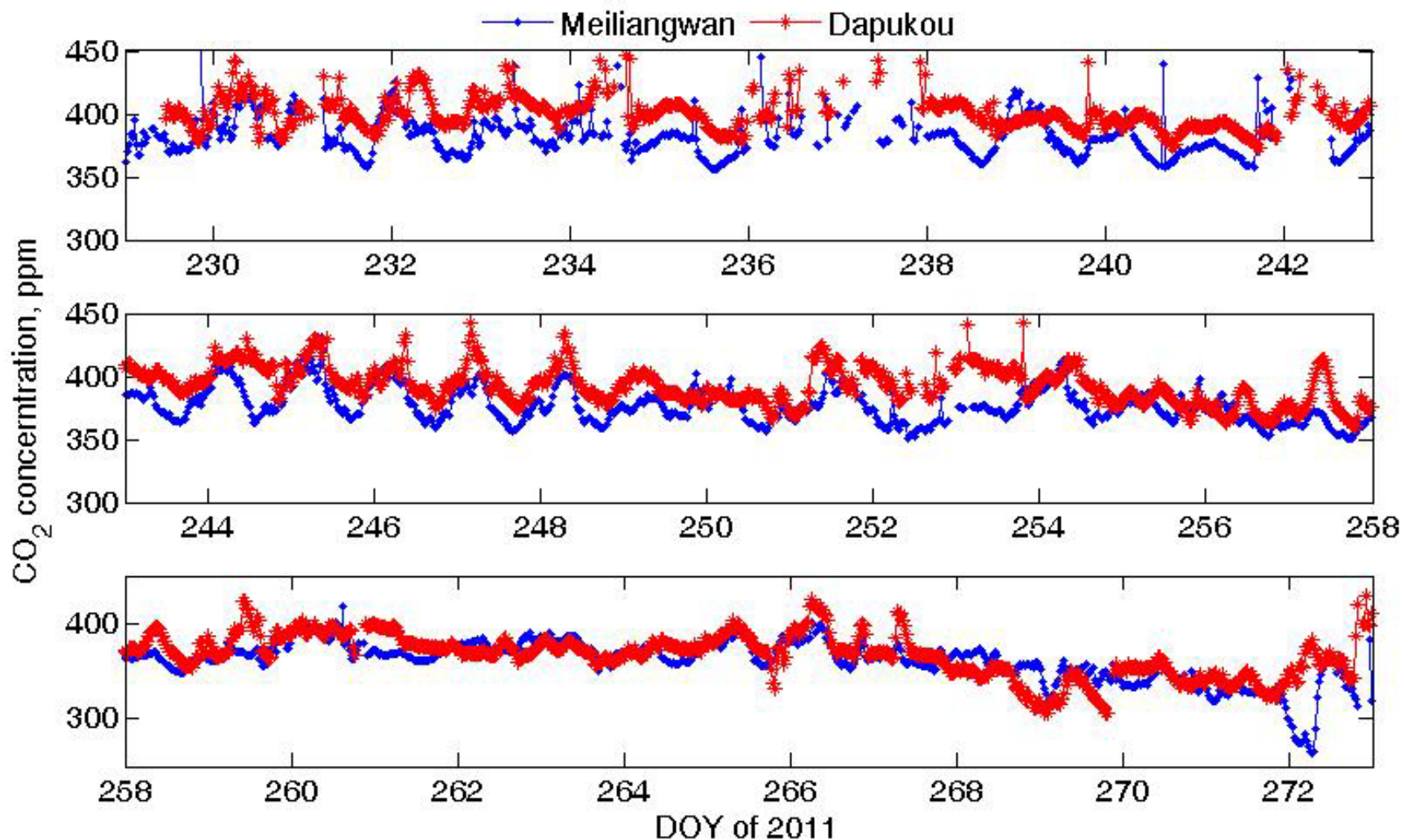
Eddy Covariance-Latent heat flux



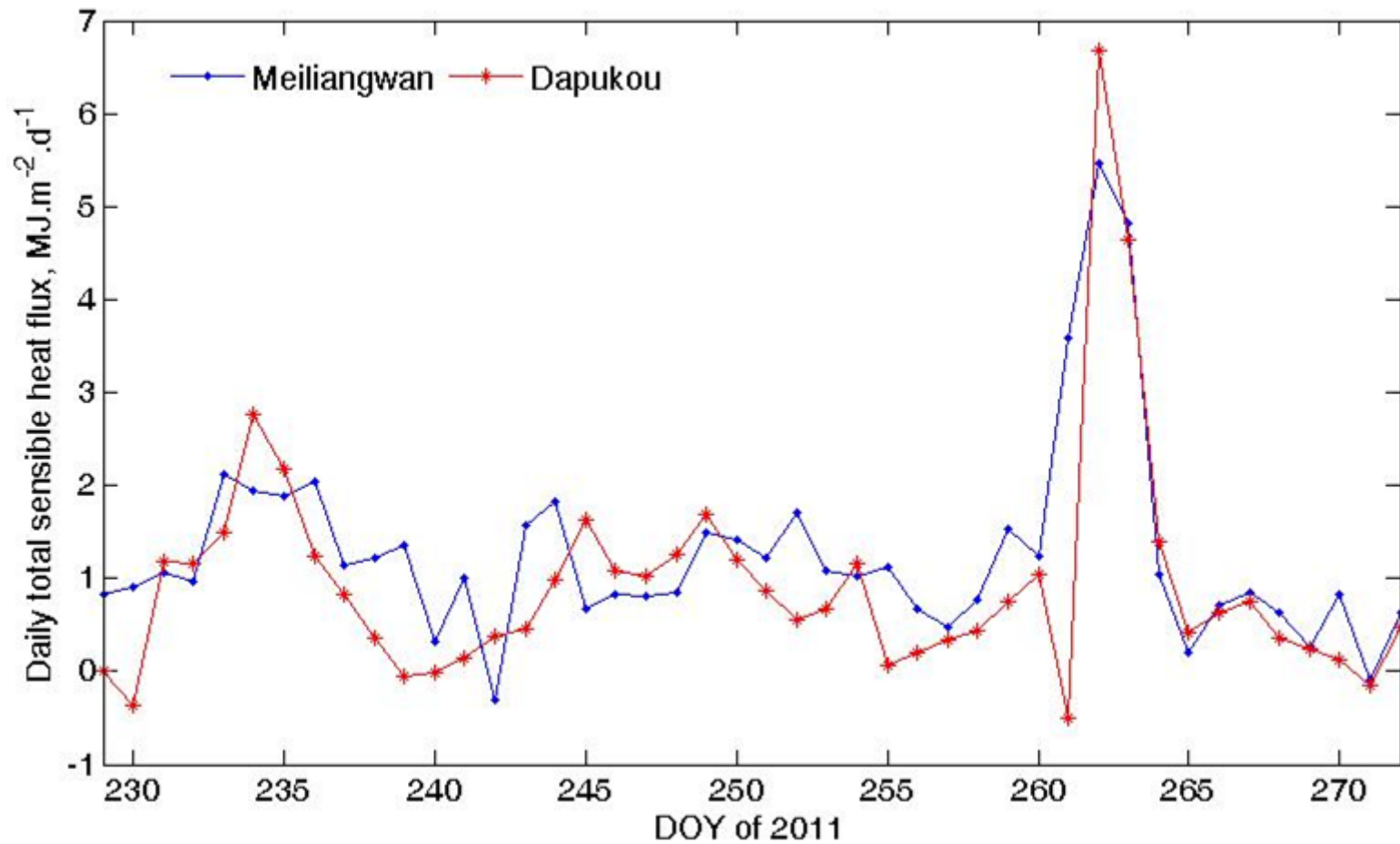
Eddy Covariance-Net ecosystem exchange



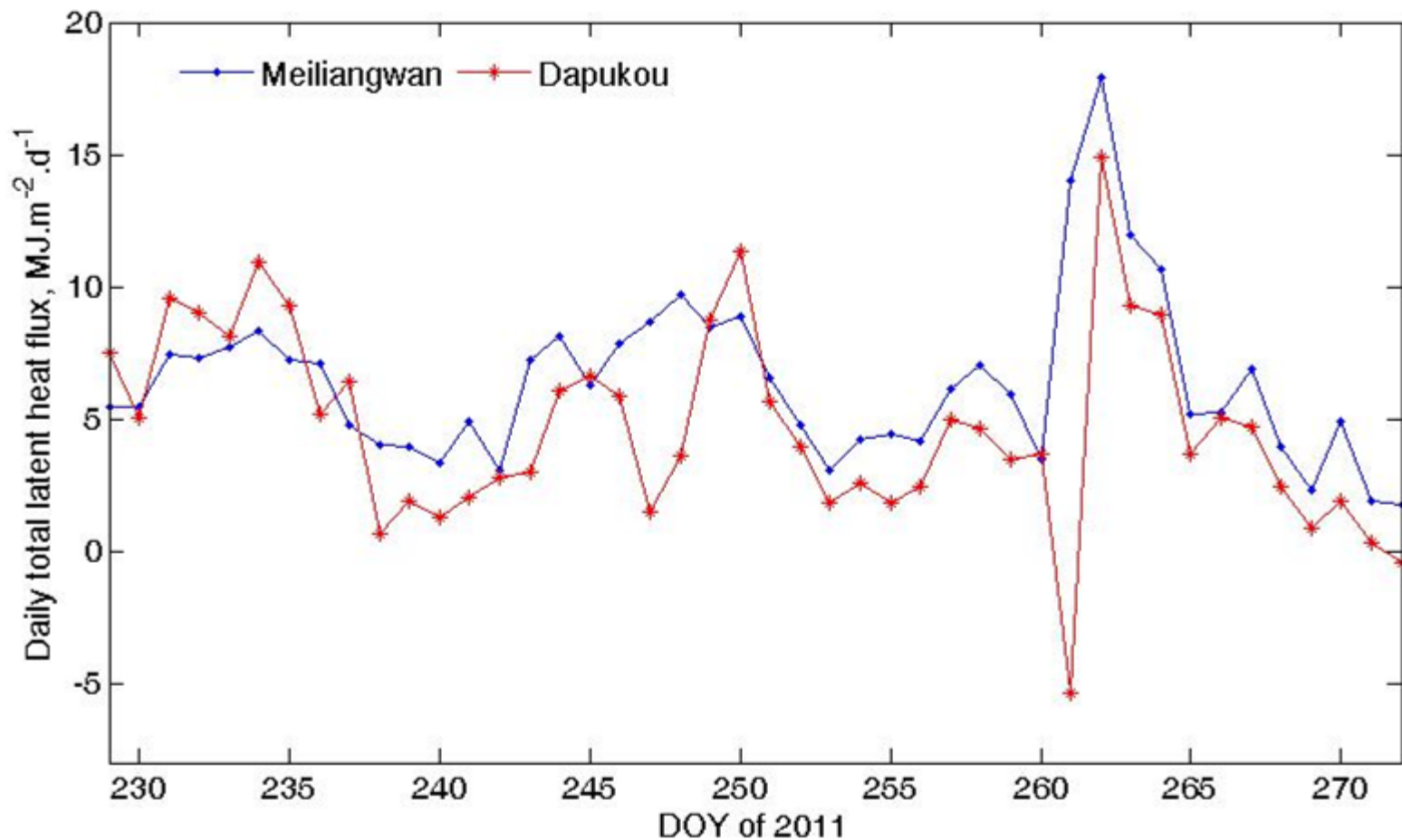
Eddy Covariance-CO₂ concentration



Eddy Covariance-Daily total sensible heat flux



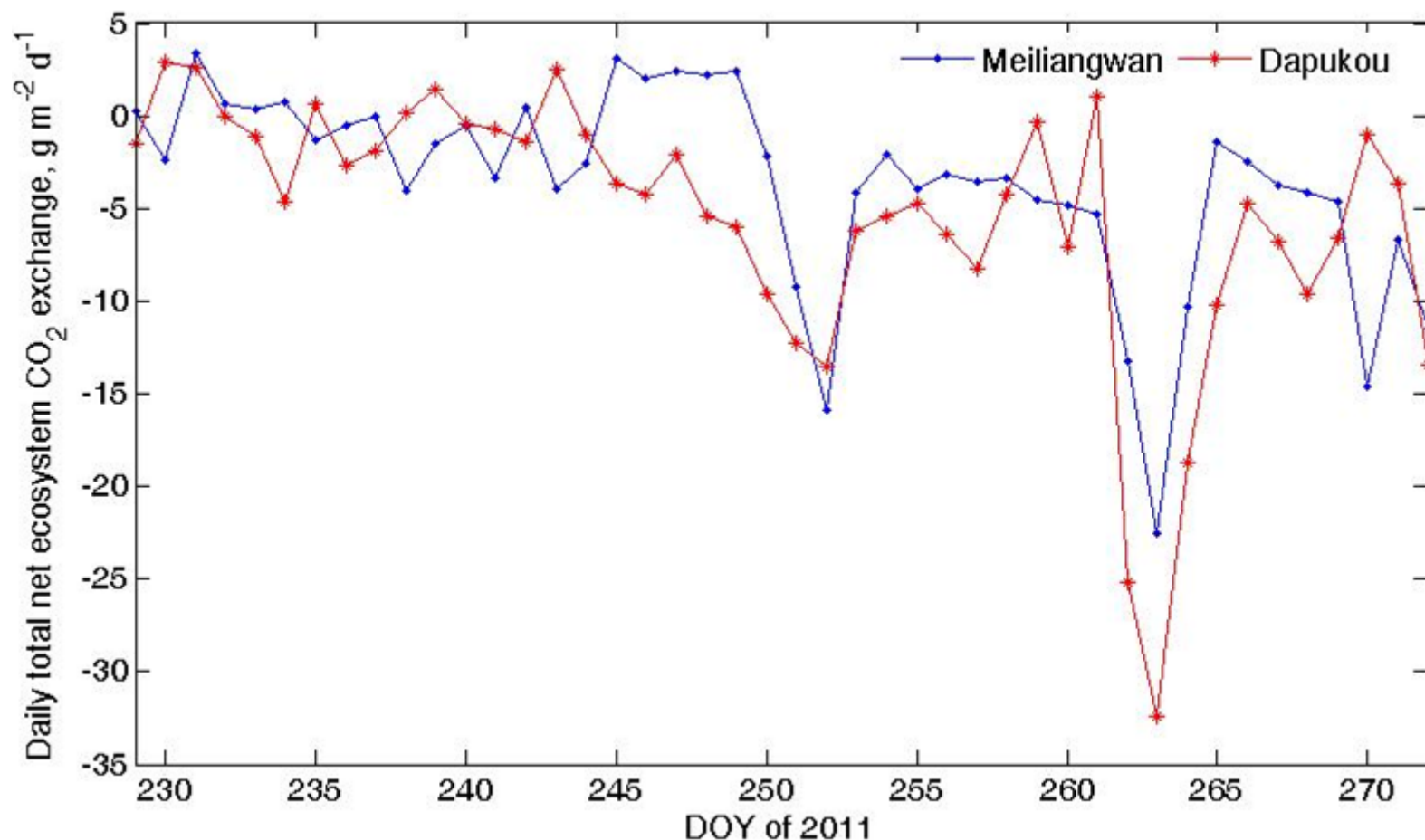
Eddy Covariance-Daily total latent heat flux



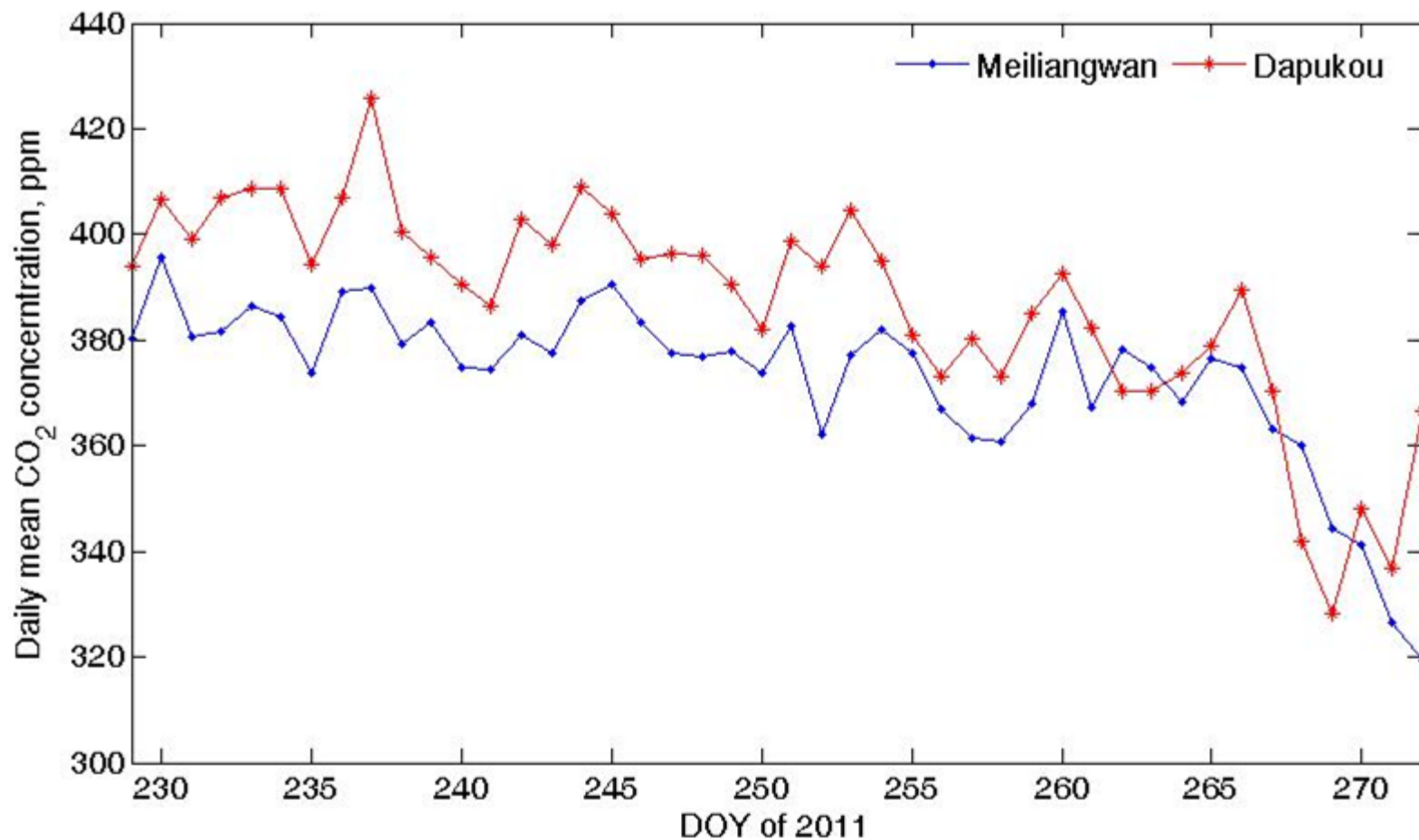
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Eddy Covariance-Daily total net ecosystem exchange



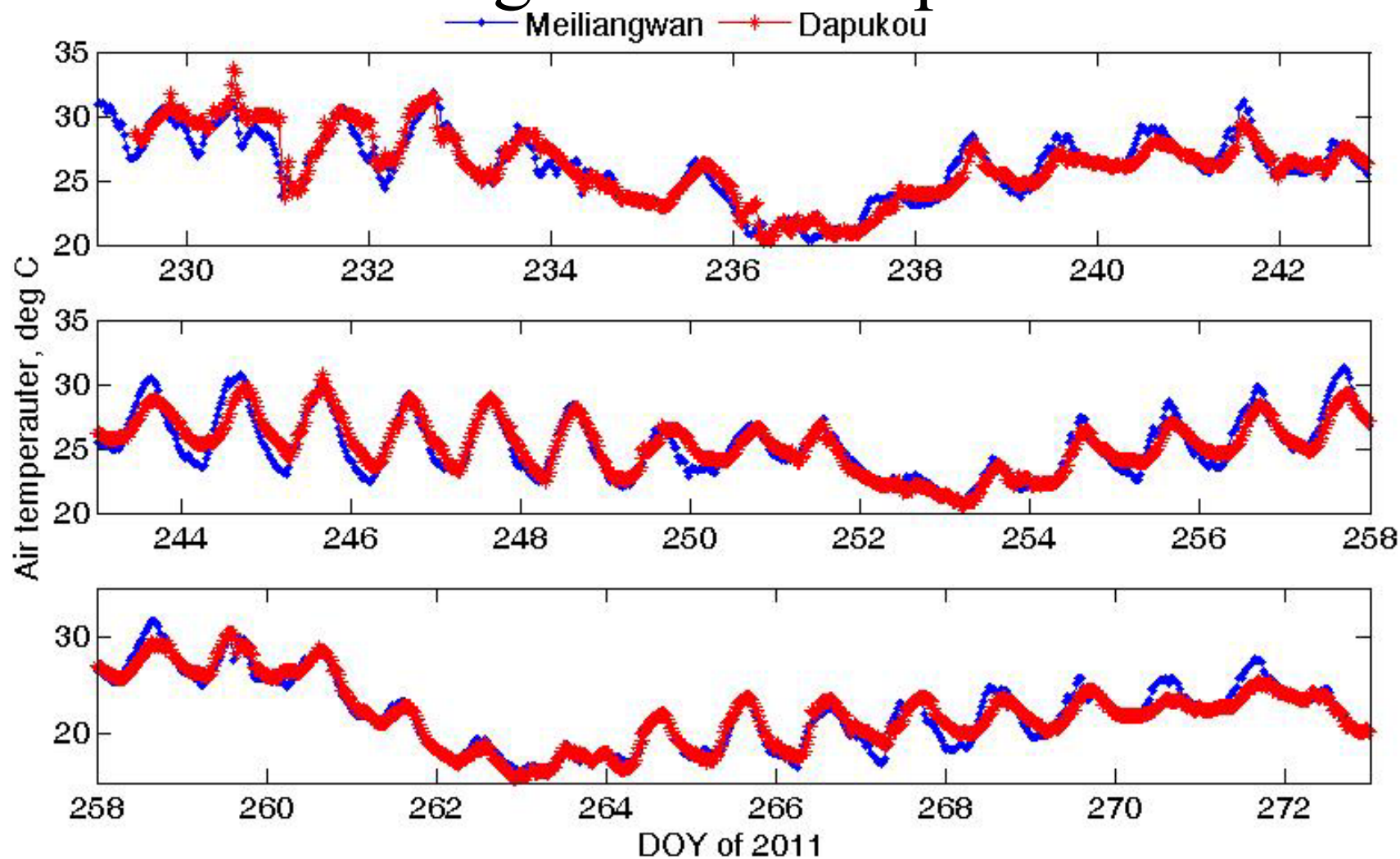
Eddy Covariance-Daily mean CO₂ concentration



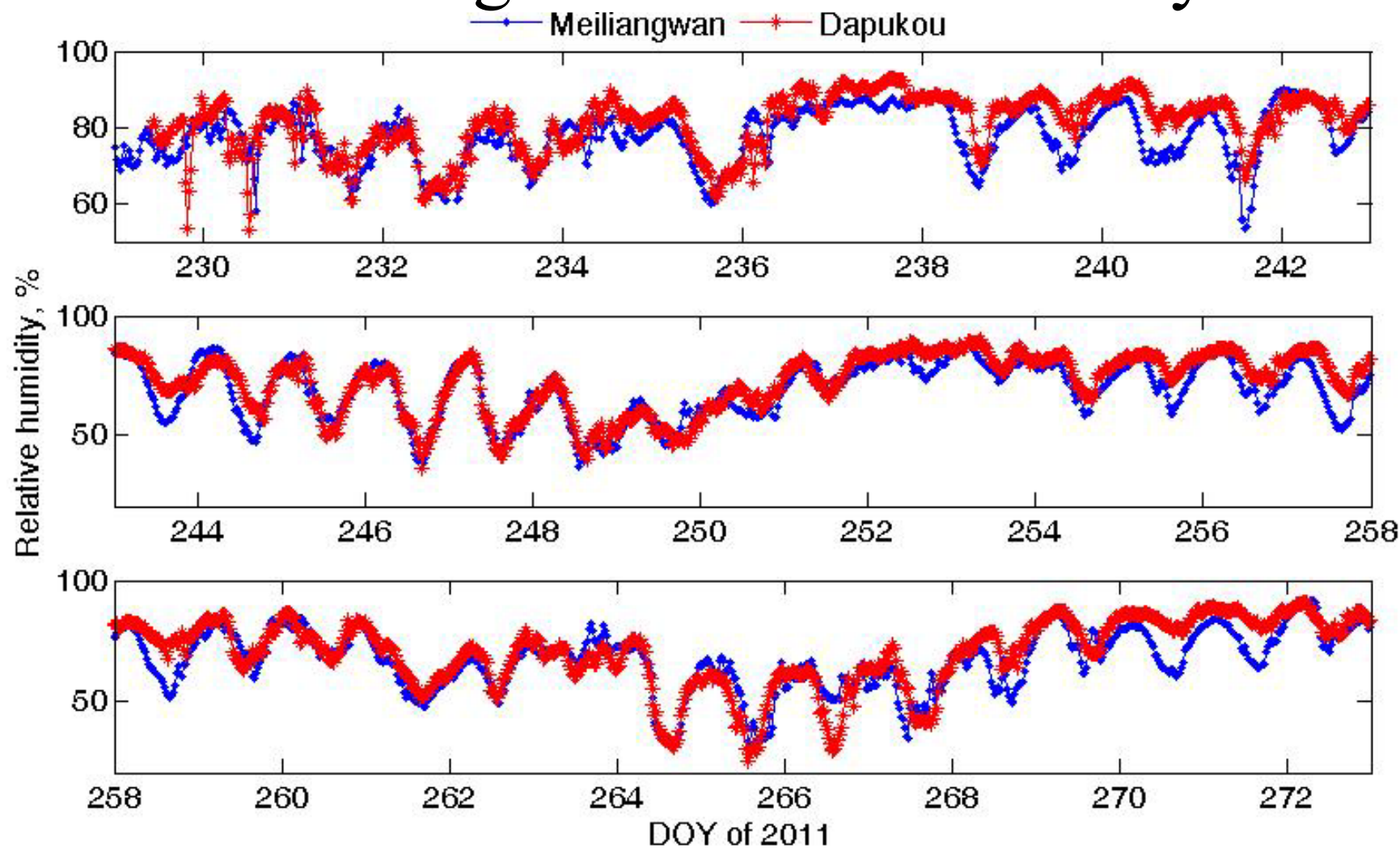
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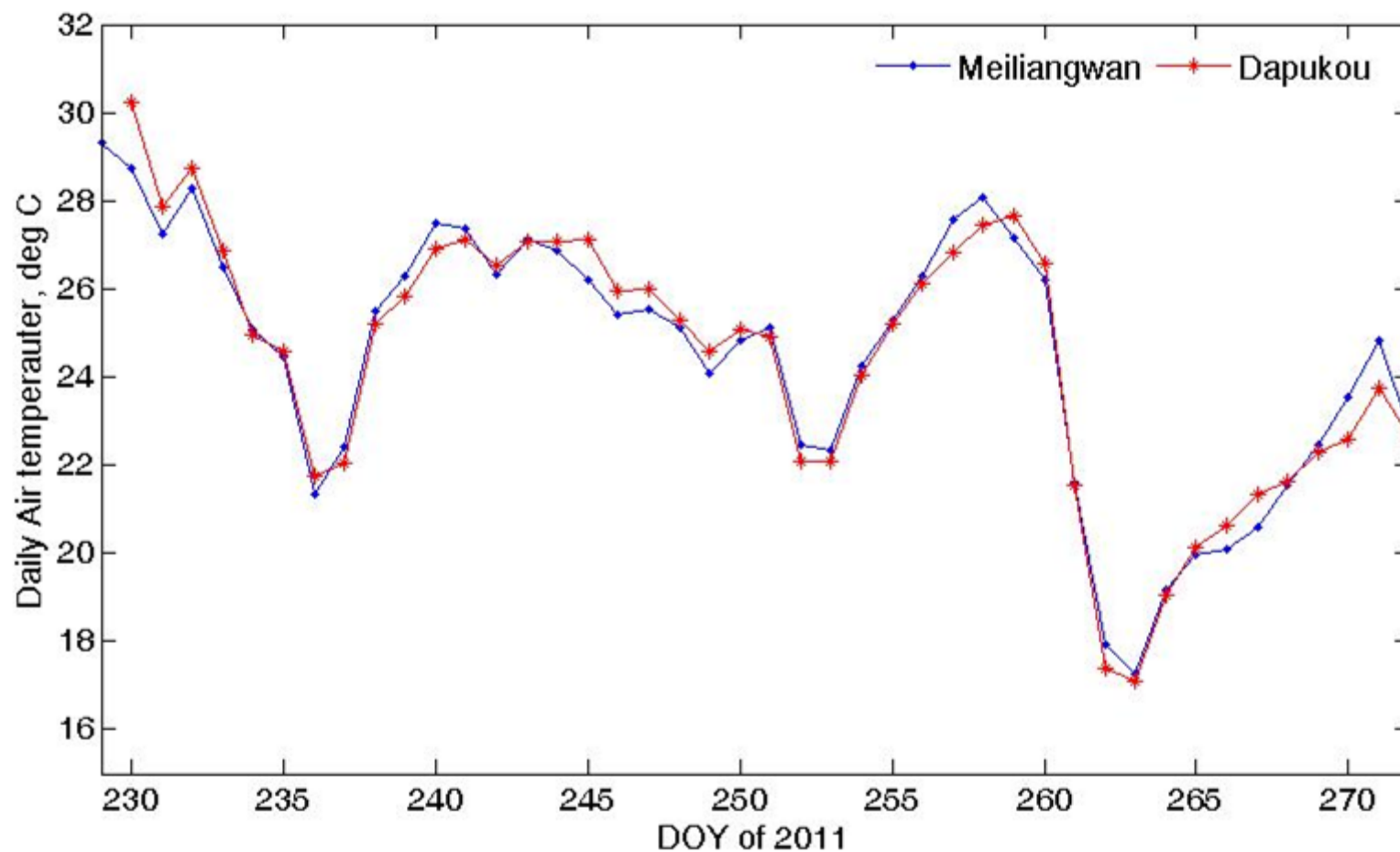
Meteorological-Air temperature



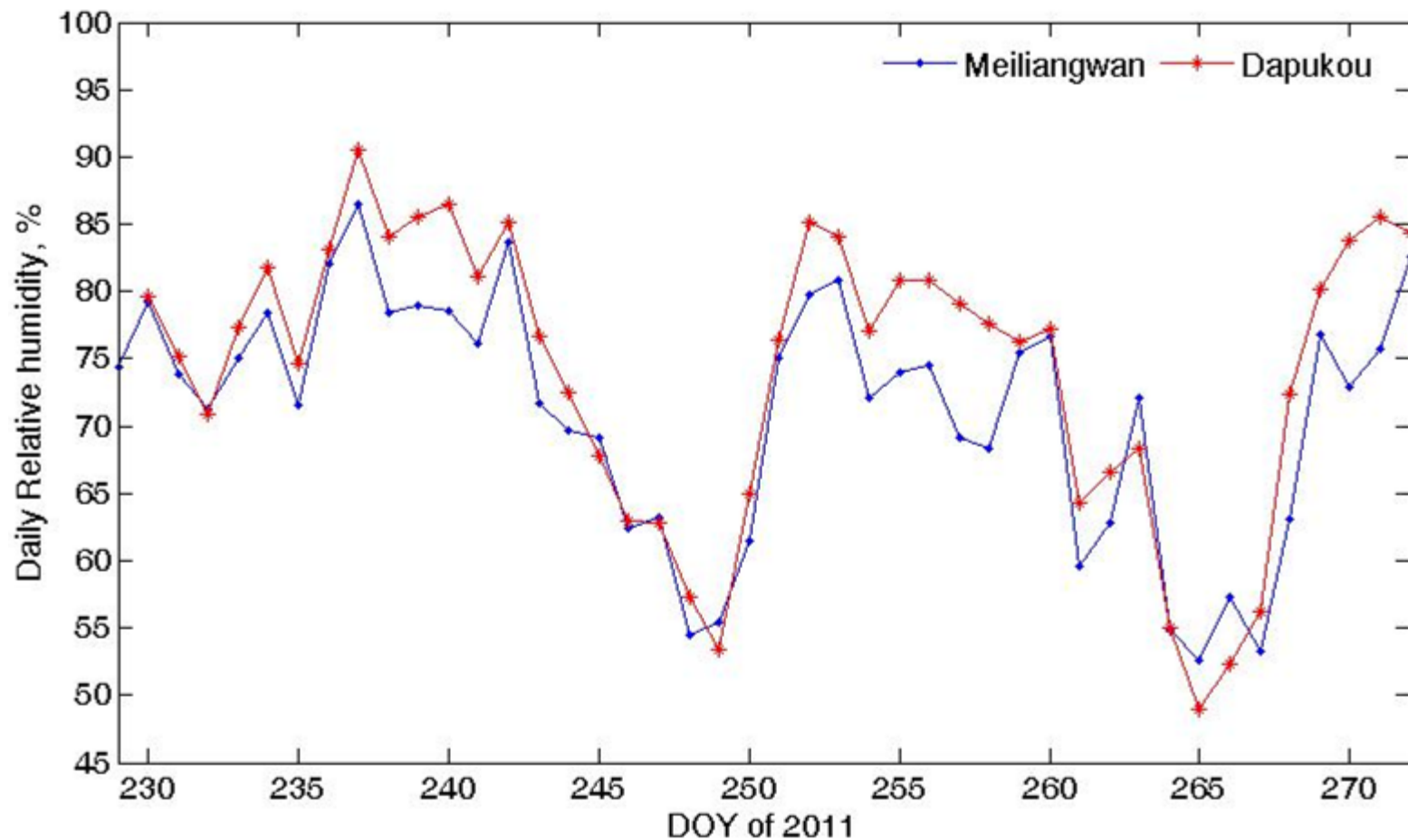
Meteorological-Relative humidity



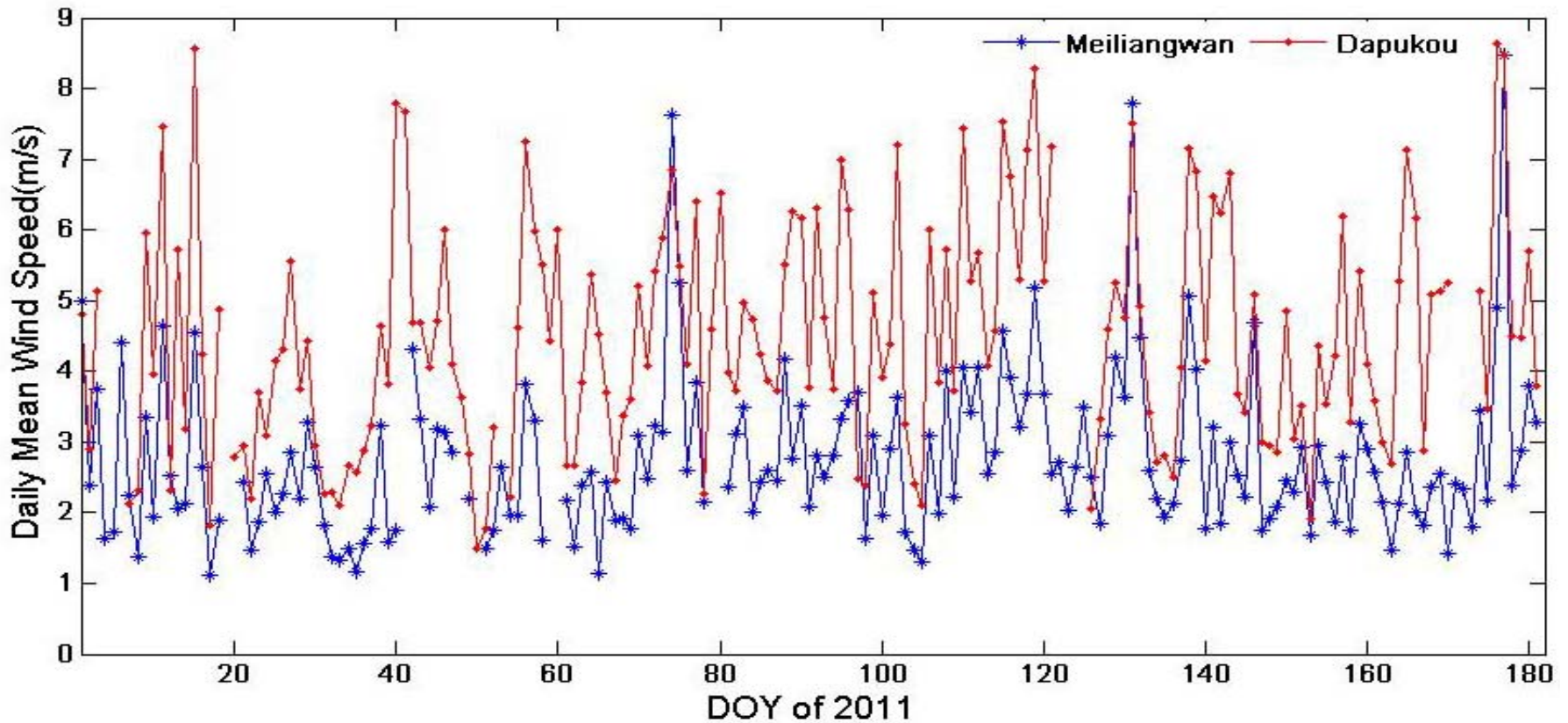
Meteorological-Daily mean air temperature



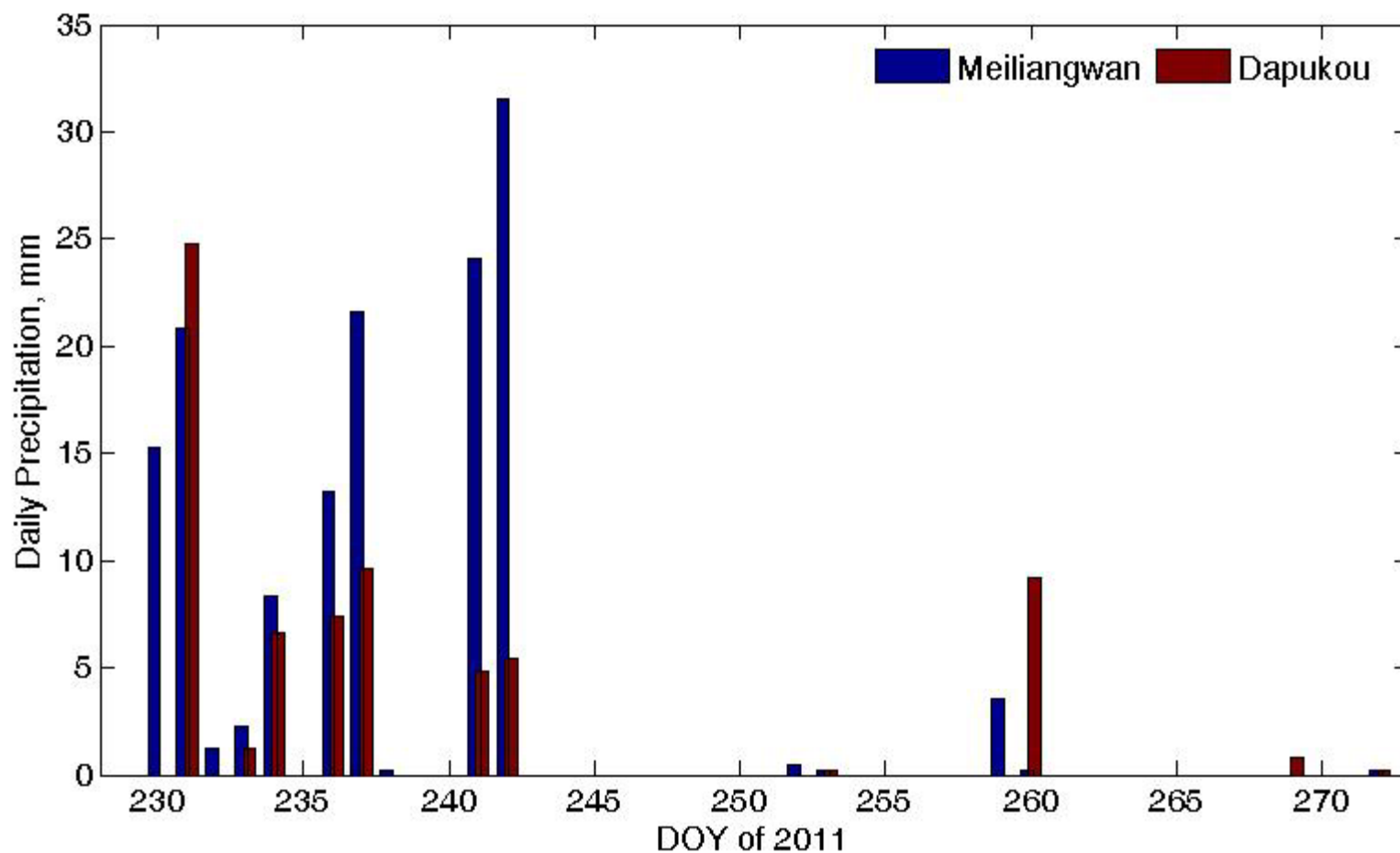
Meteorological-Daily mean relative humidity



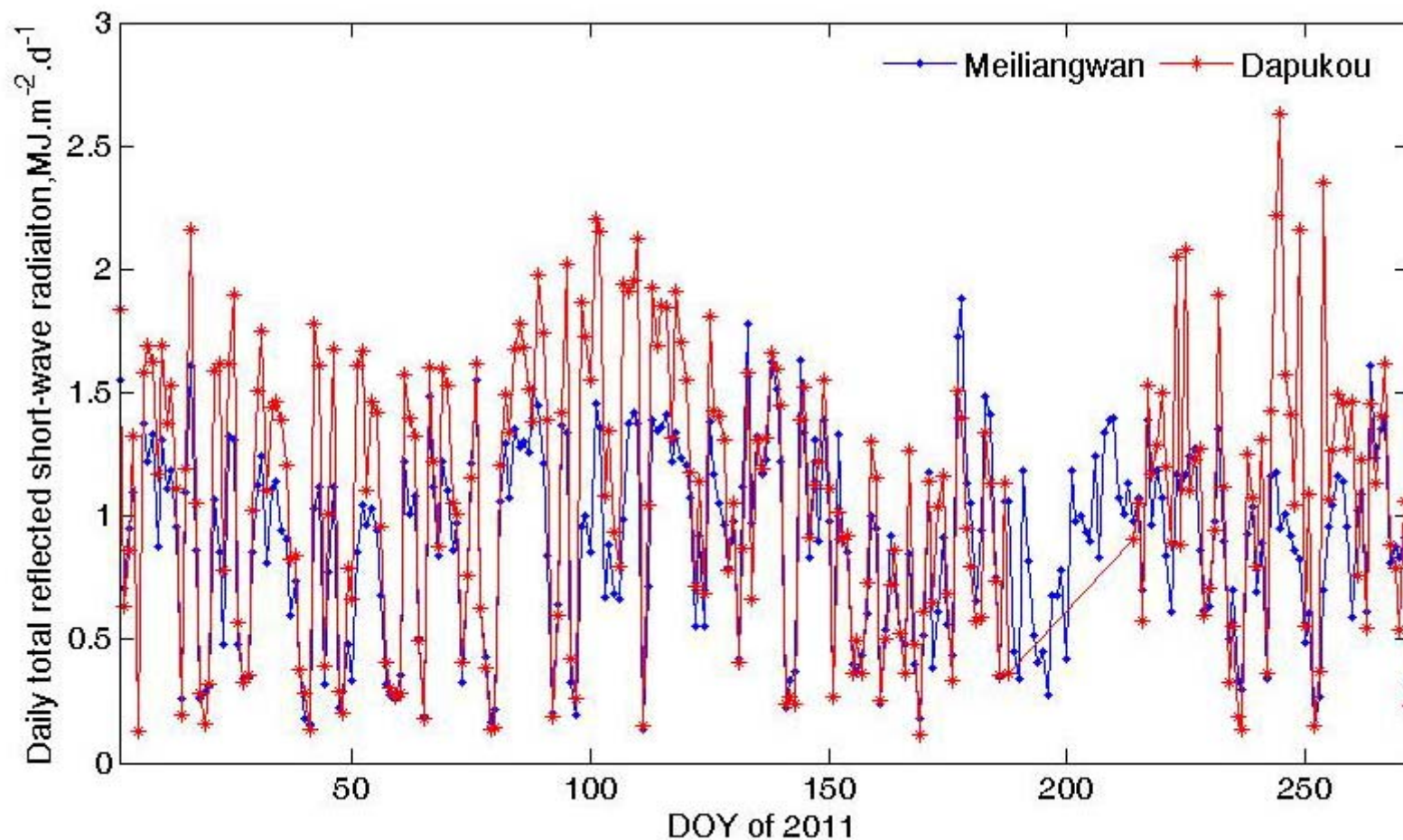
Meteorological-Daily mean wind speed



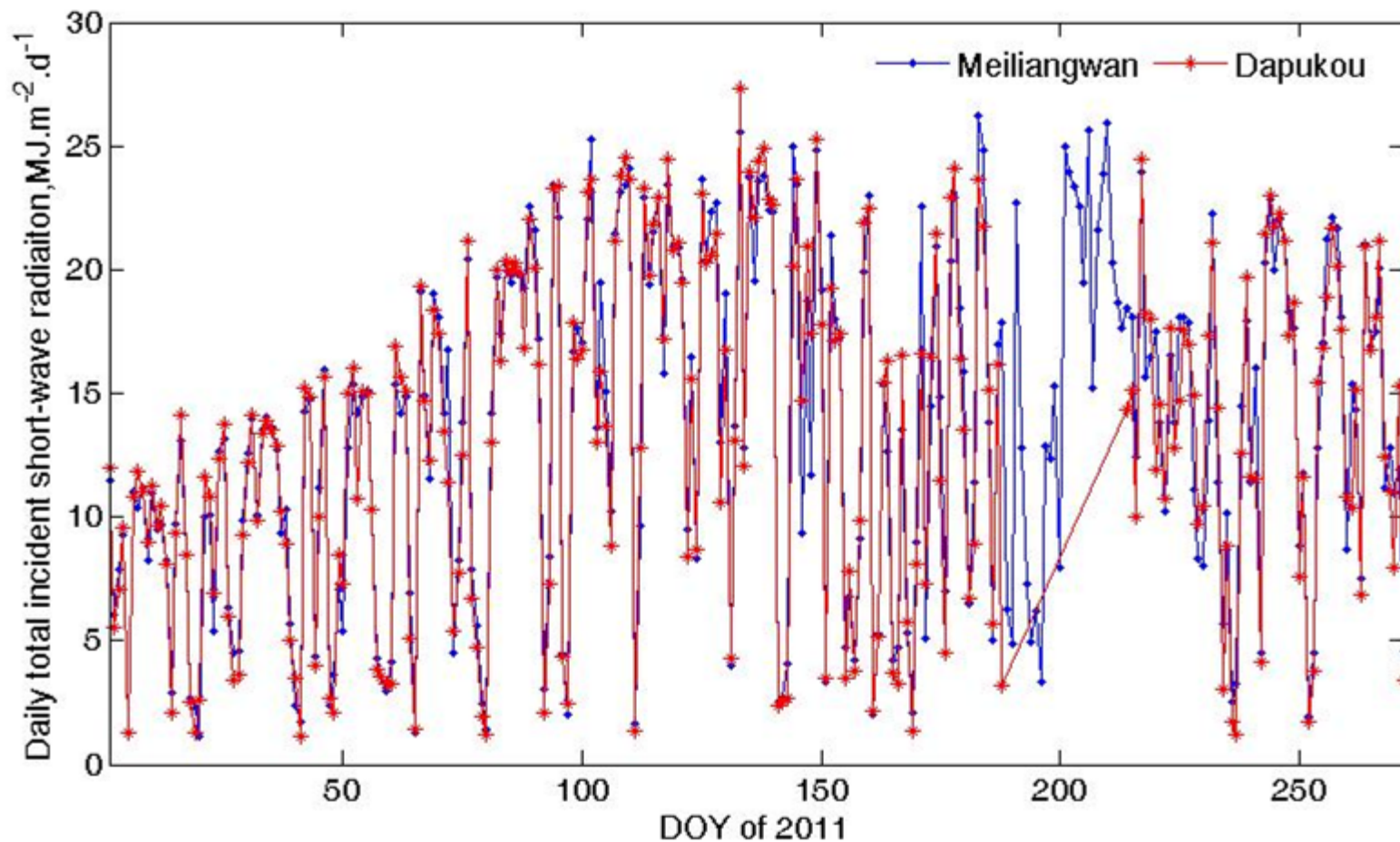
Meteorological-Daily total precipitation



Radiation-Daily total reflected short-wave radiation



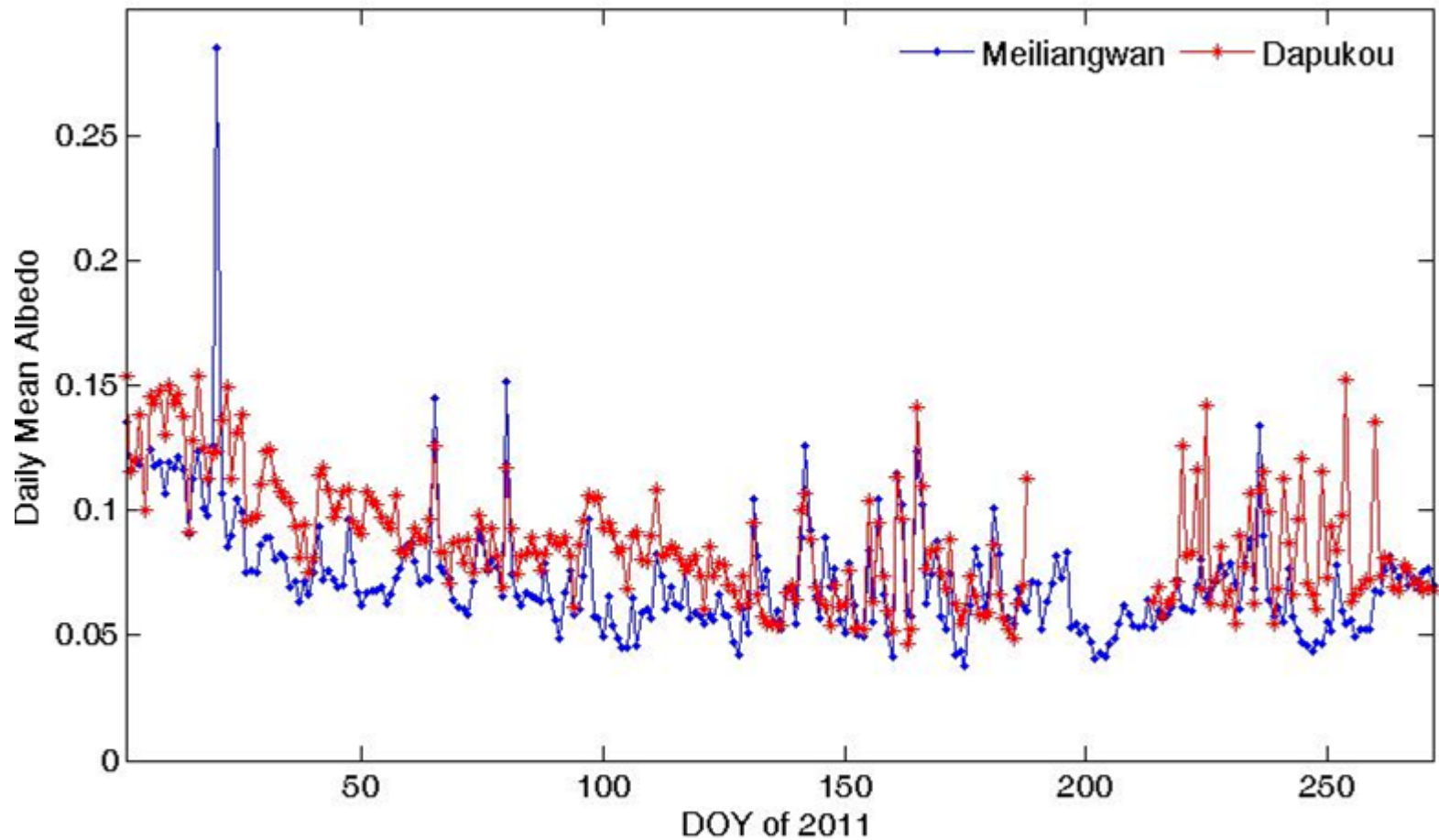
Radiation-Daily total incident short-wave radiation



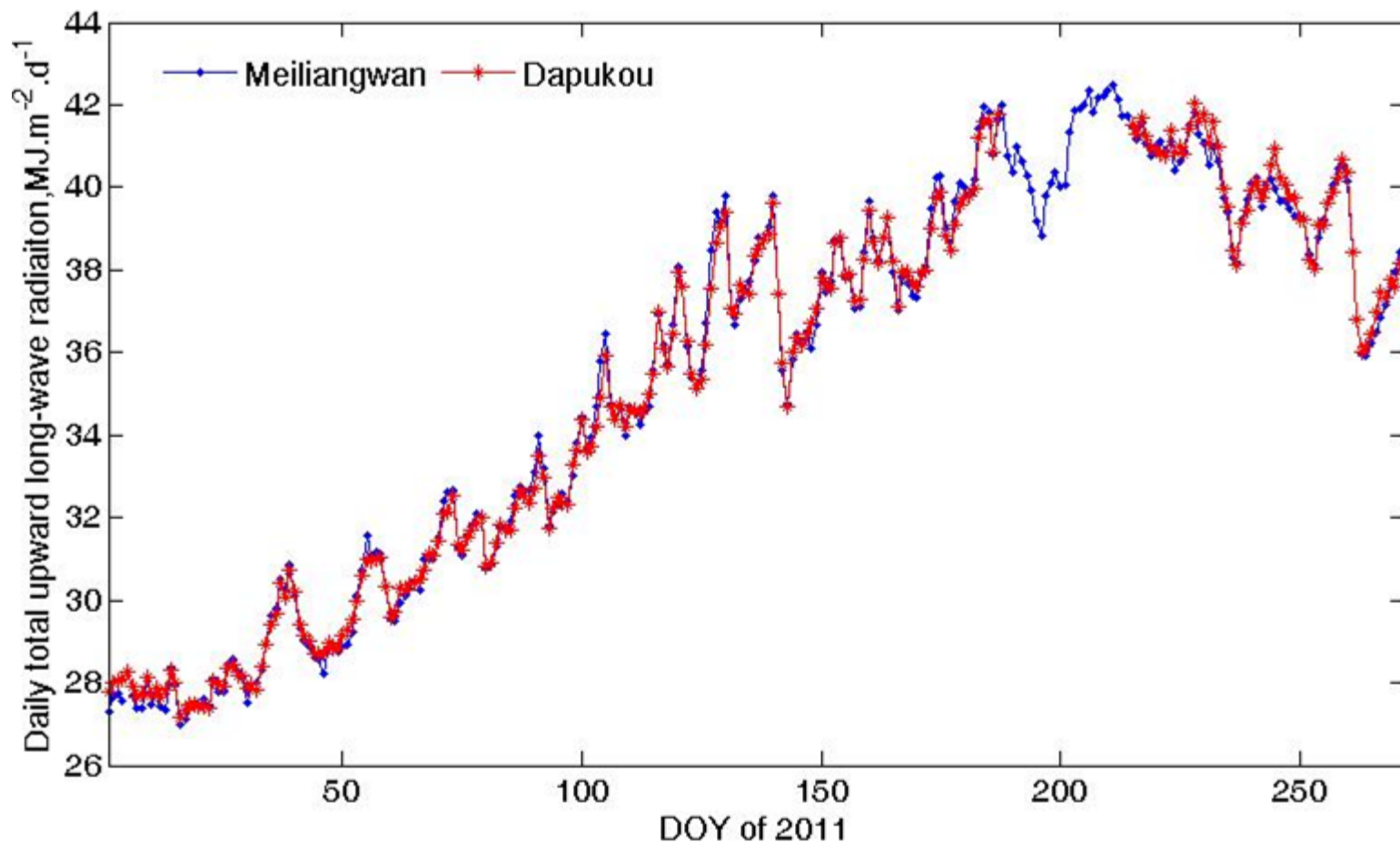
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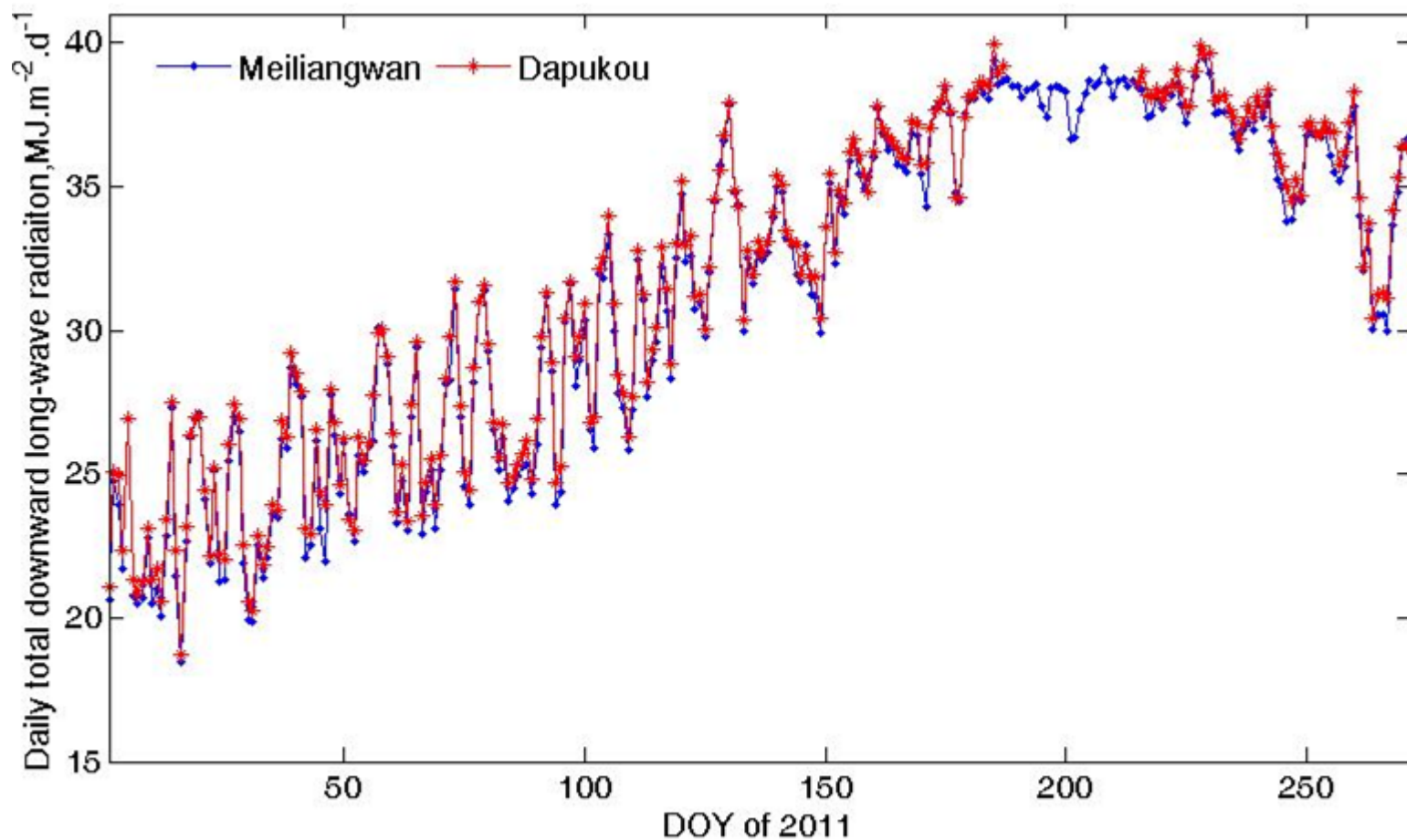
Radiation-Daily mean albedo



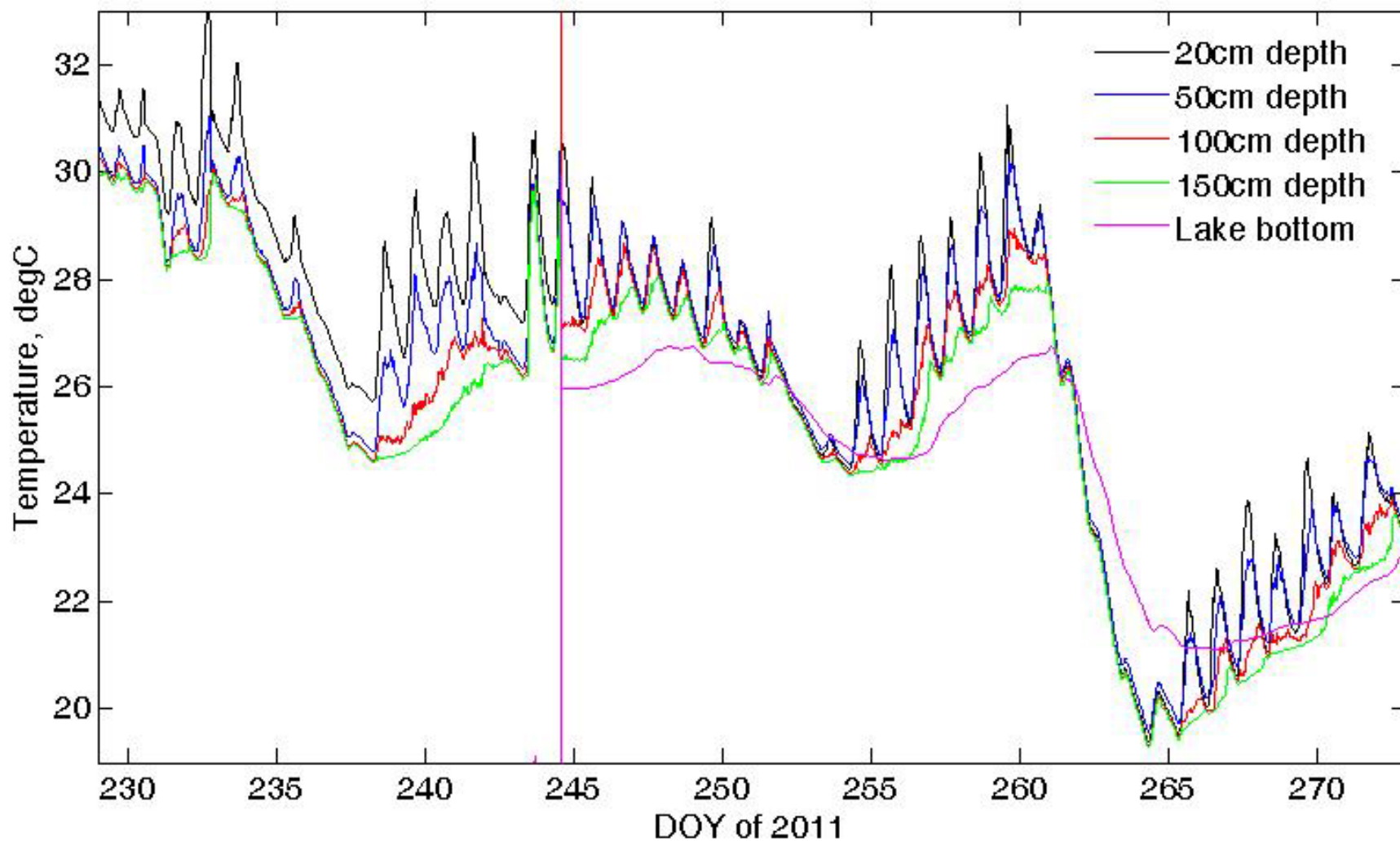
Radiation-Daily total upward long-wave radiation



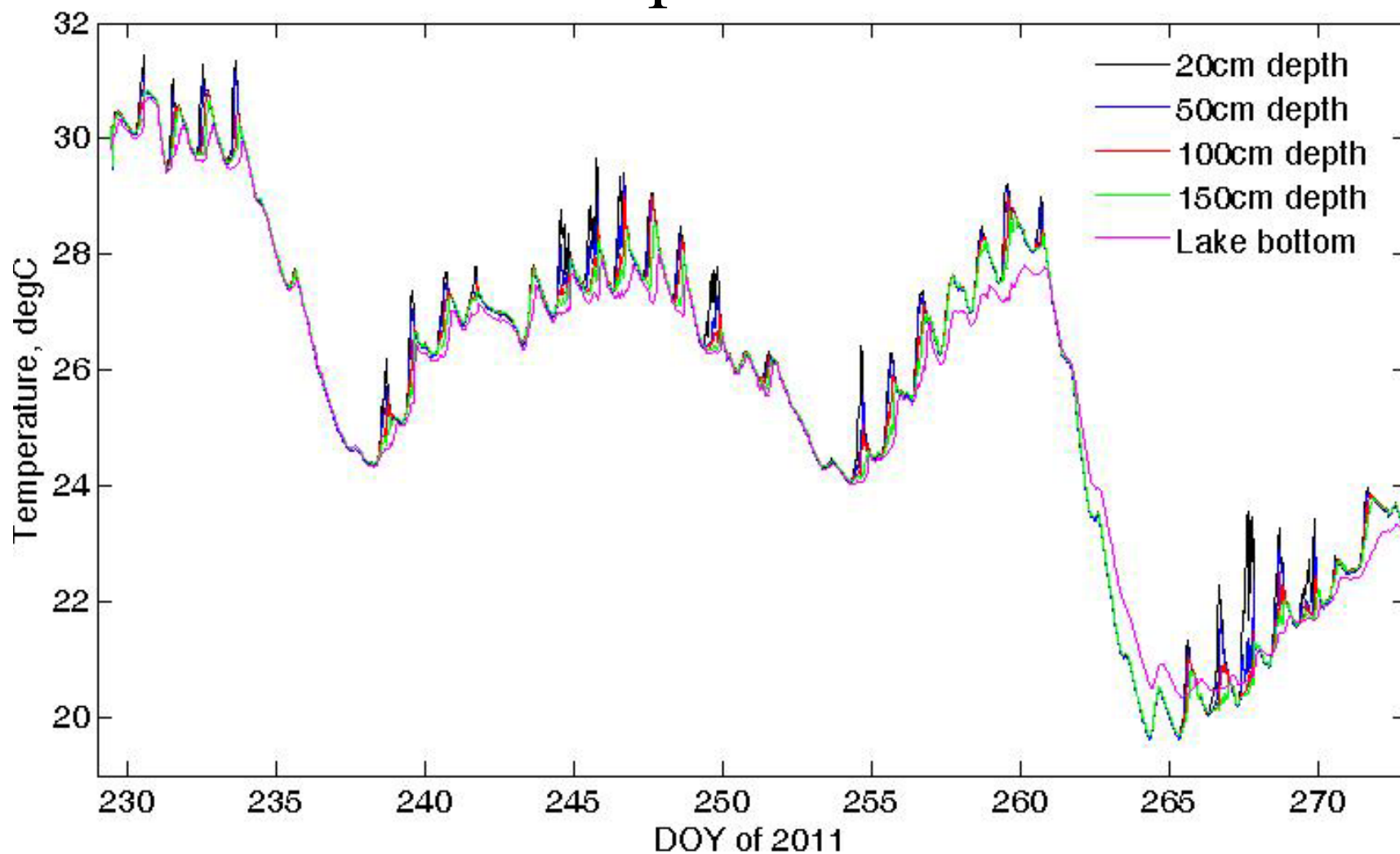
Radiation-Daily total downward long-wave radiation



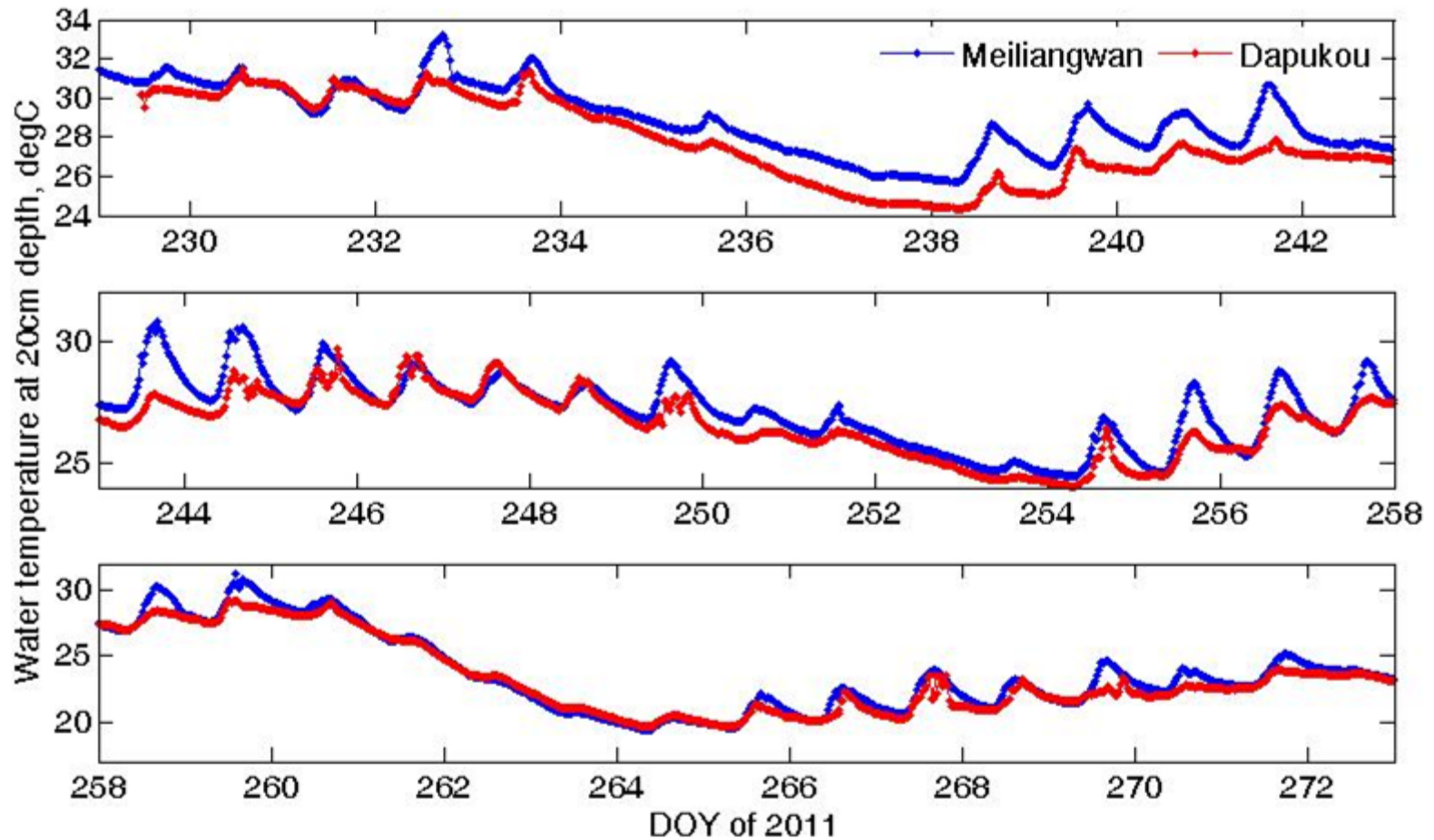
Water temperature-MLW



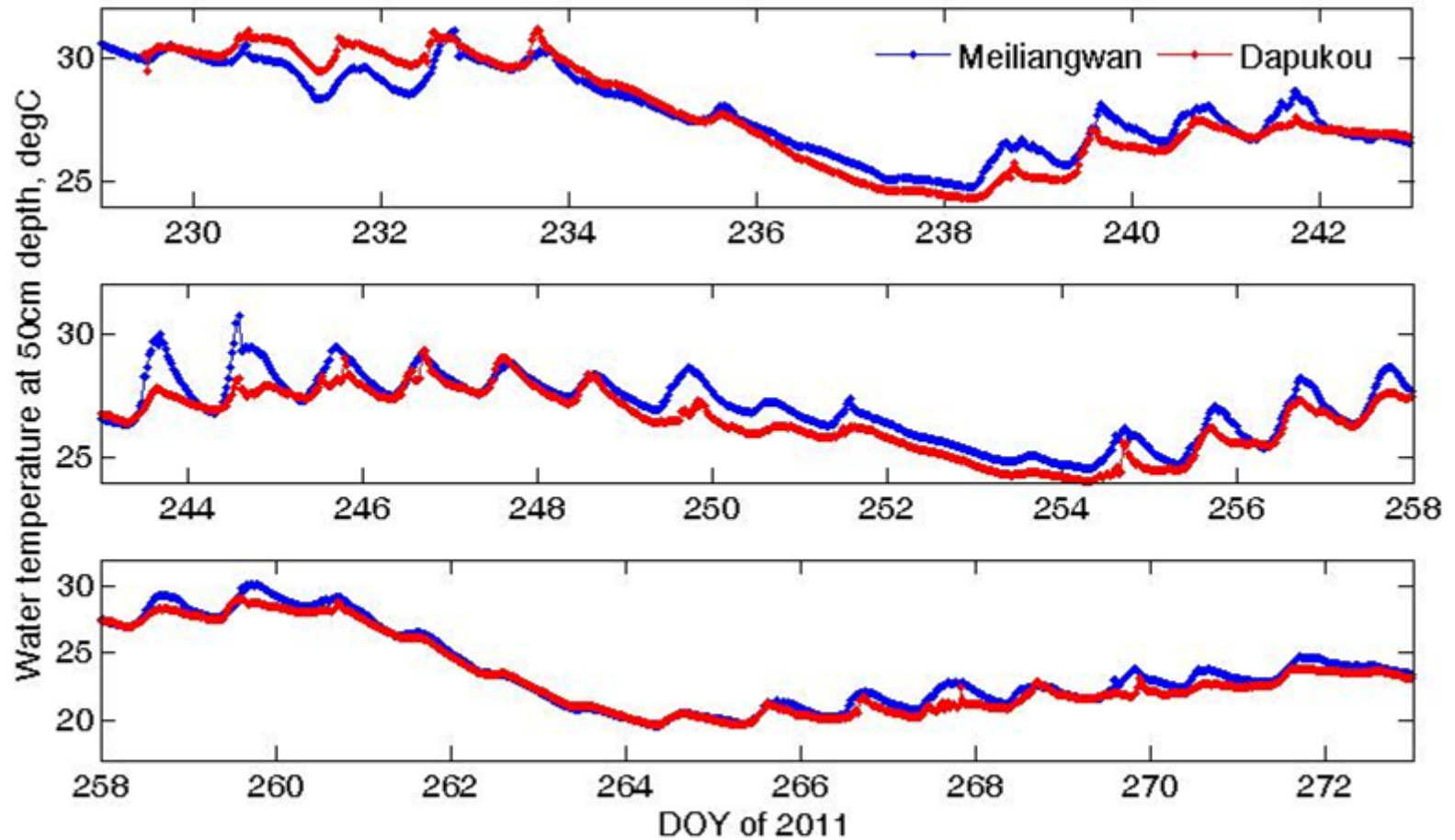
Water temperature-DPK



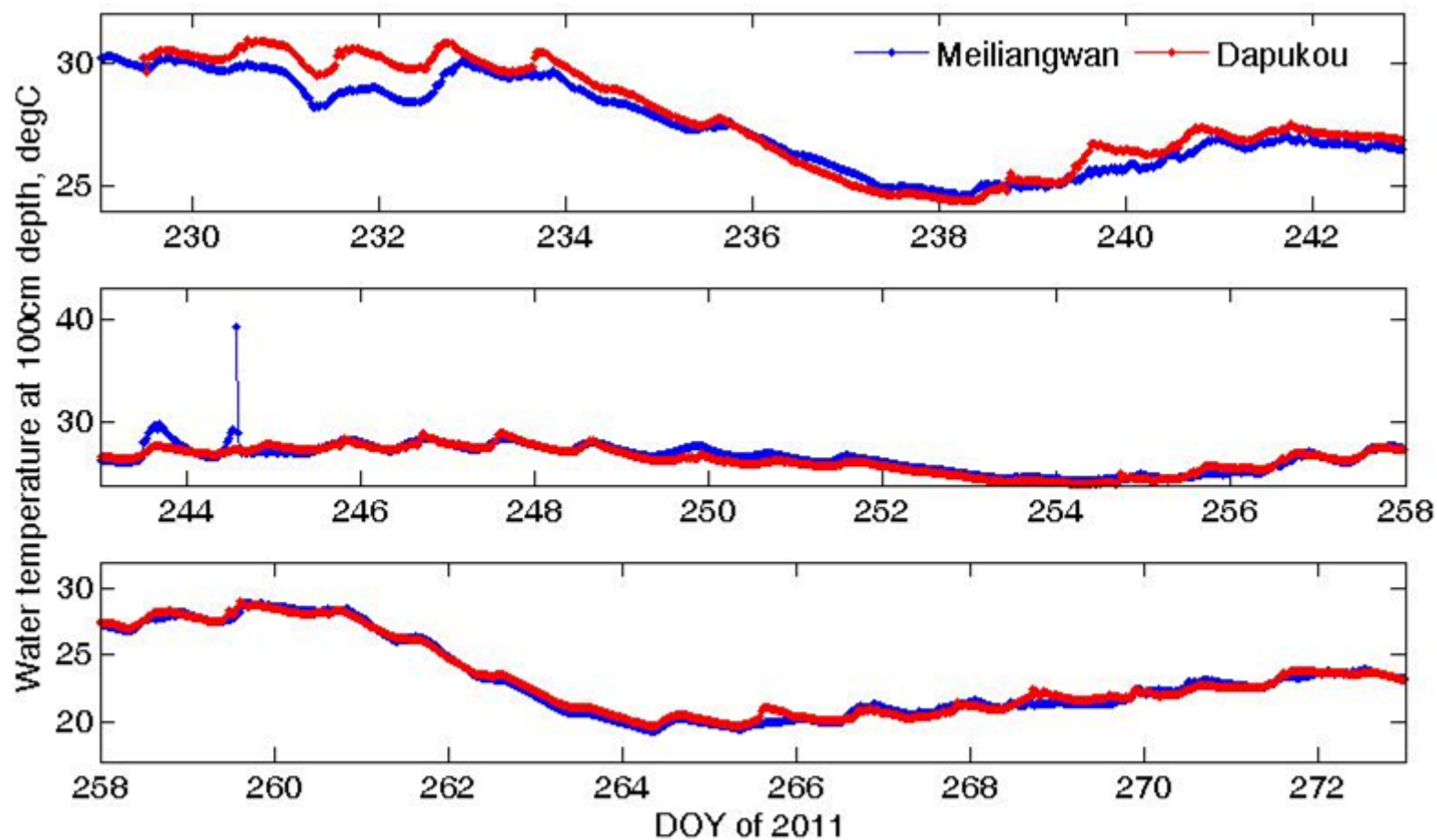
Water temperature-20cm depth



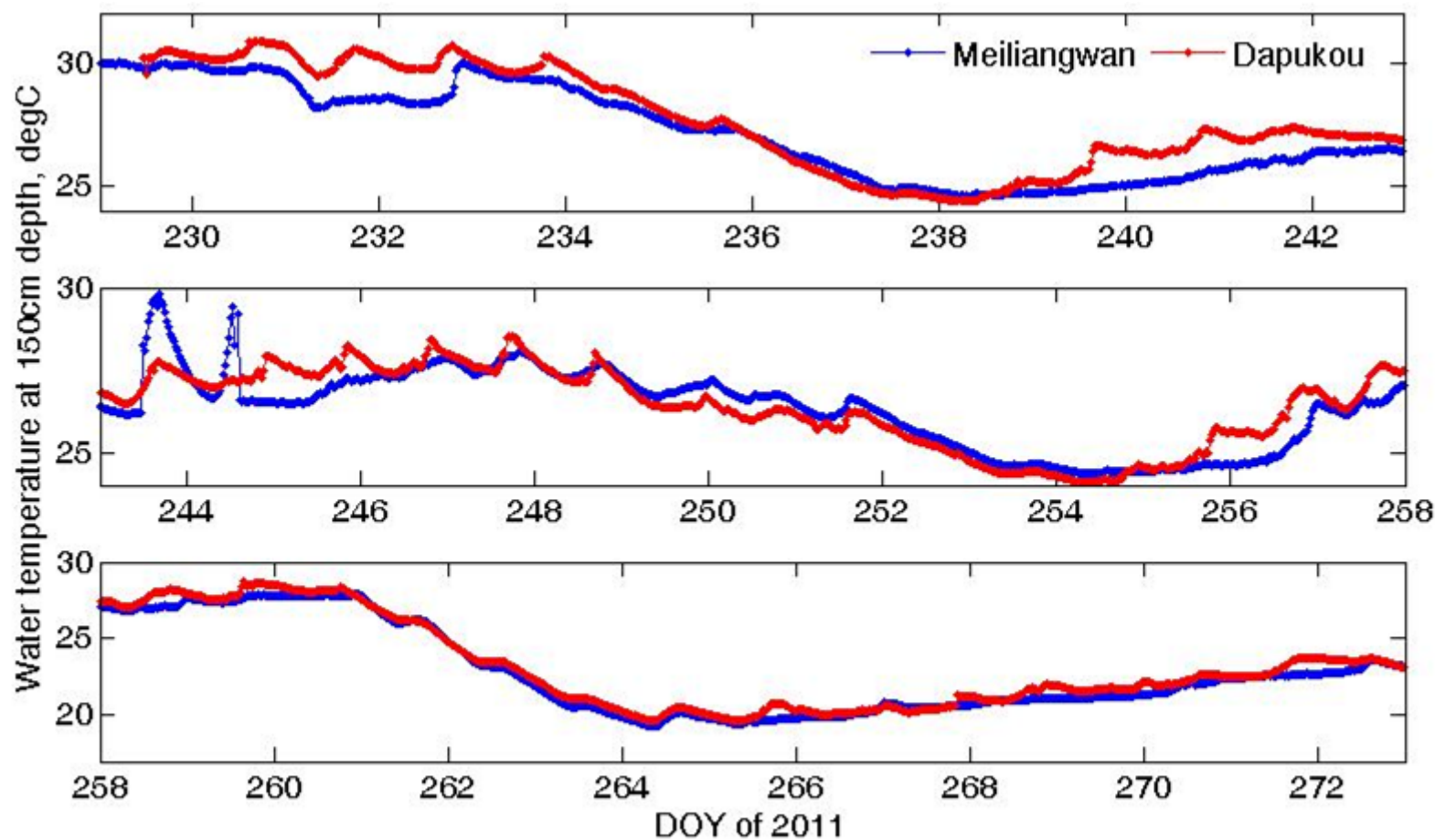
Water temperature-50cm depth



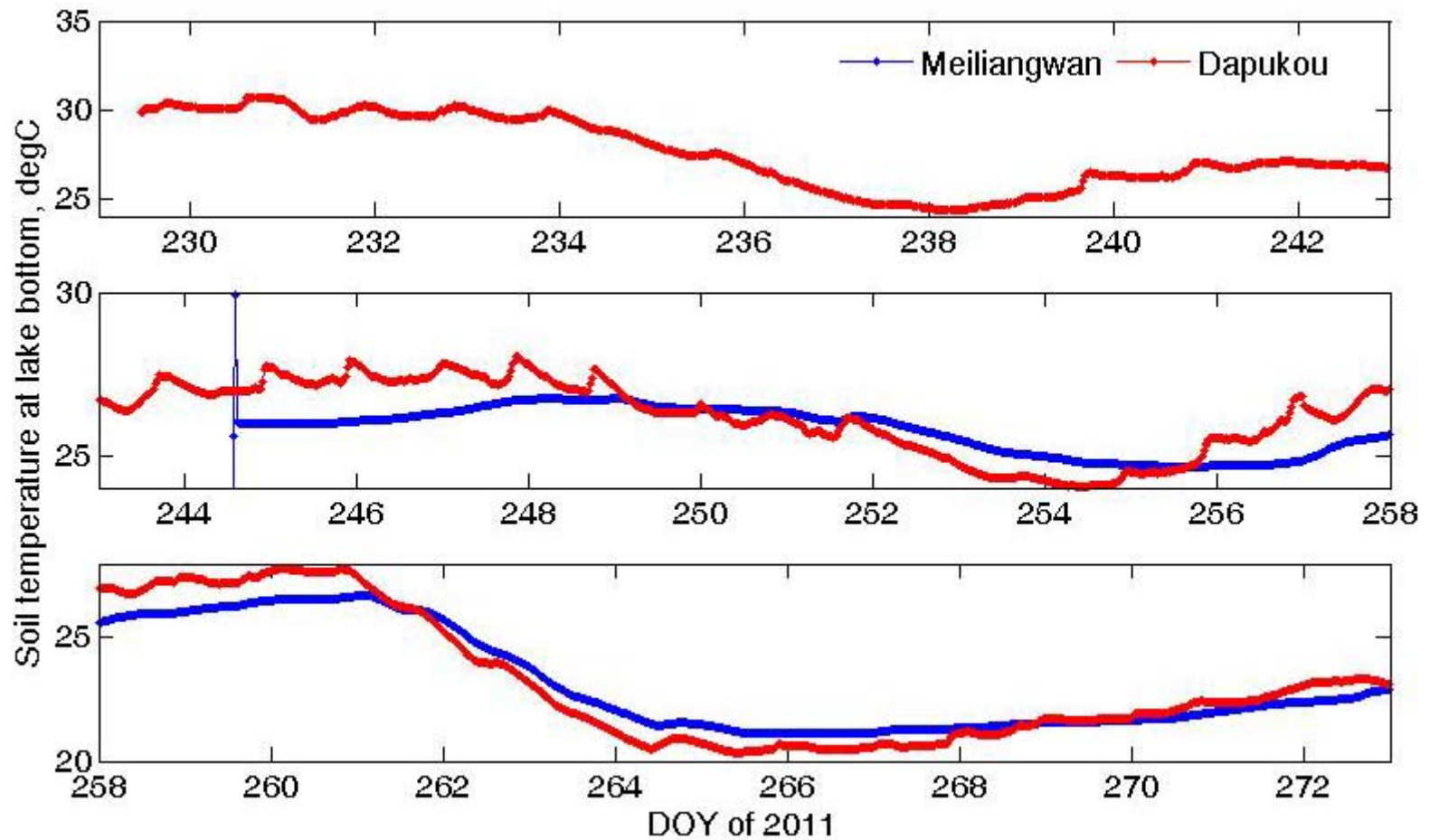
Water temperature-100cm depth



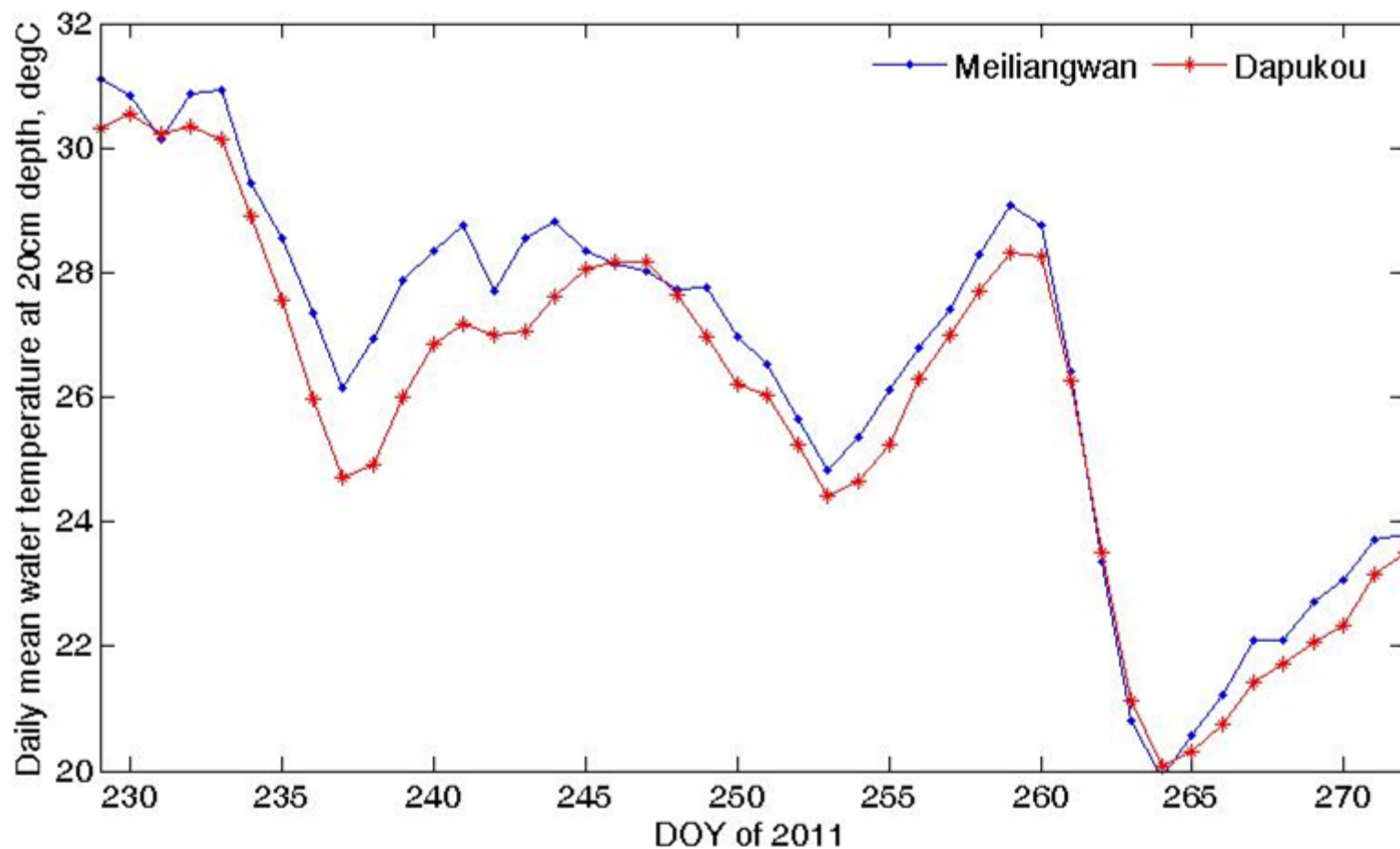
Water temperature-150cm depth



Water temperature-Lake bottom



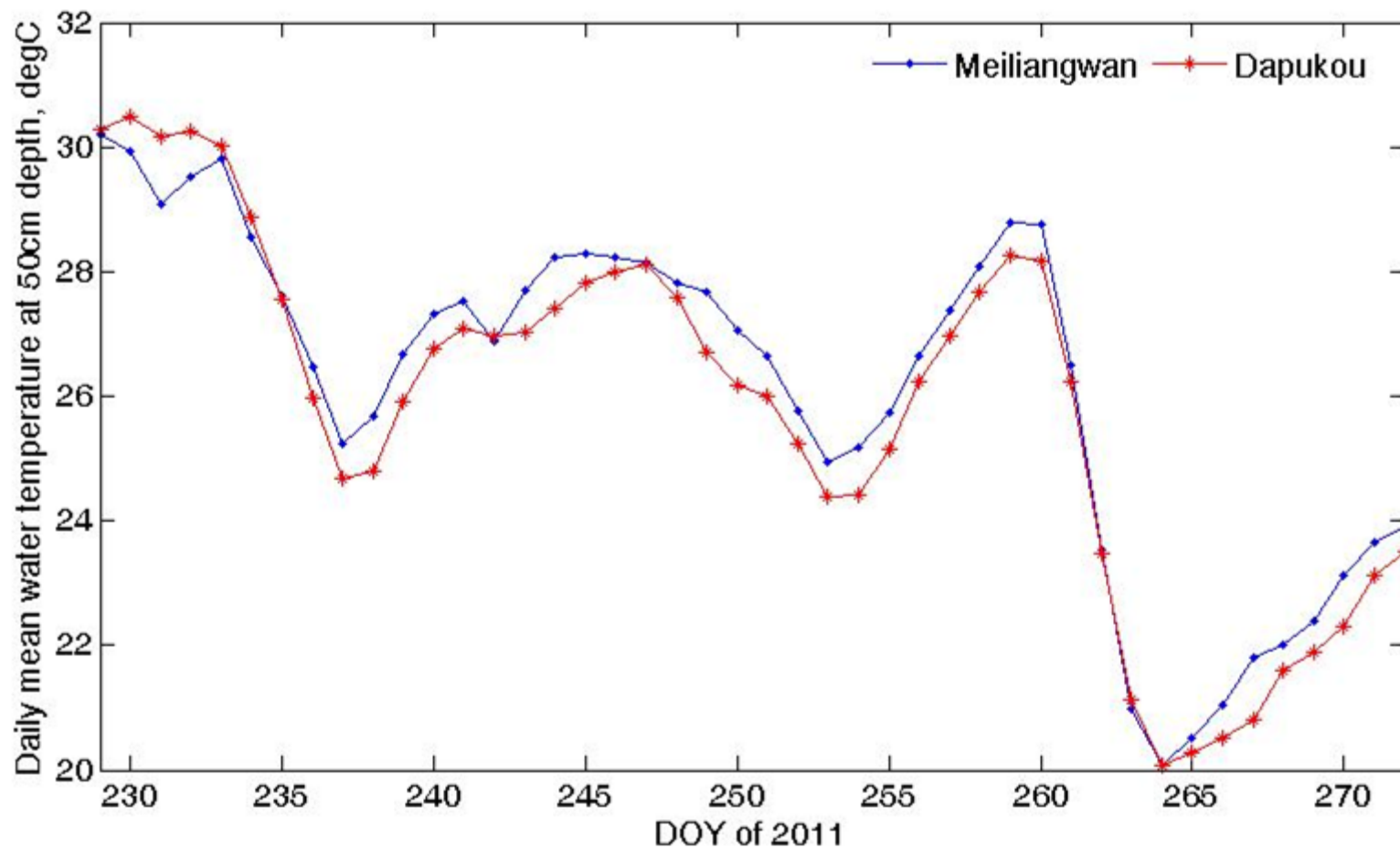
Water temperature-daily mean at 20cm depth



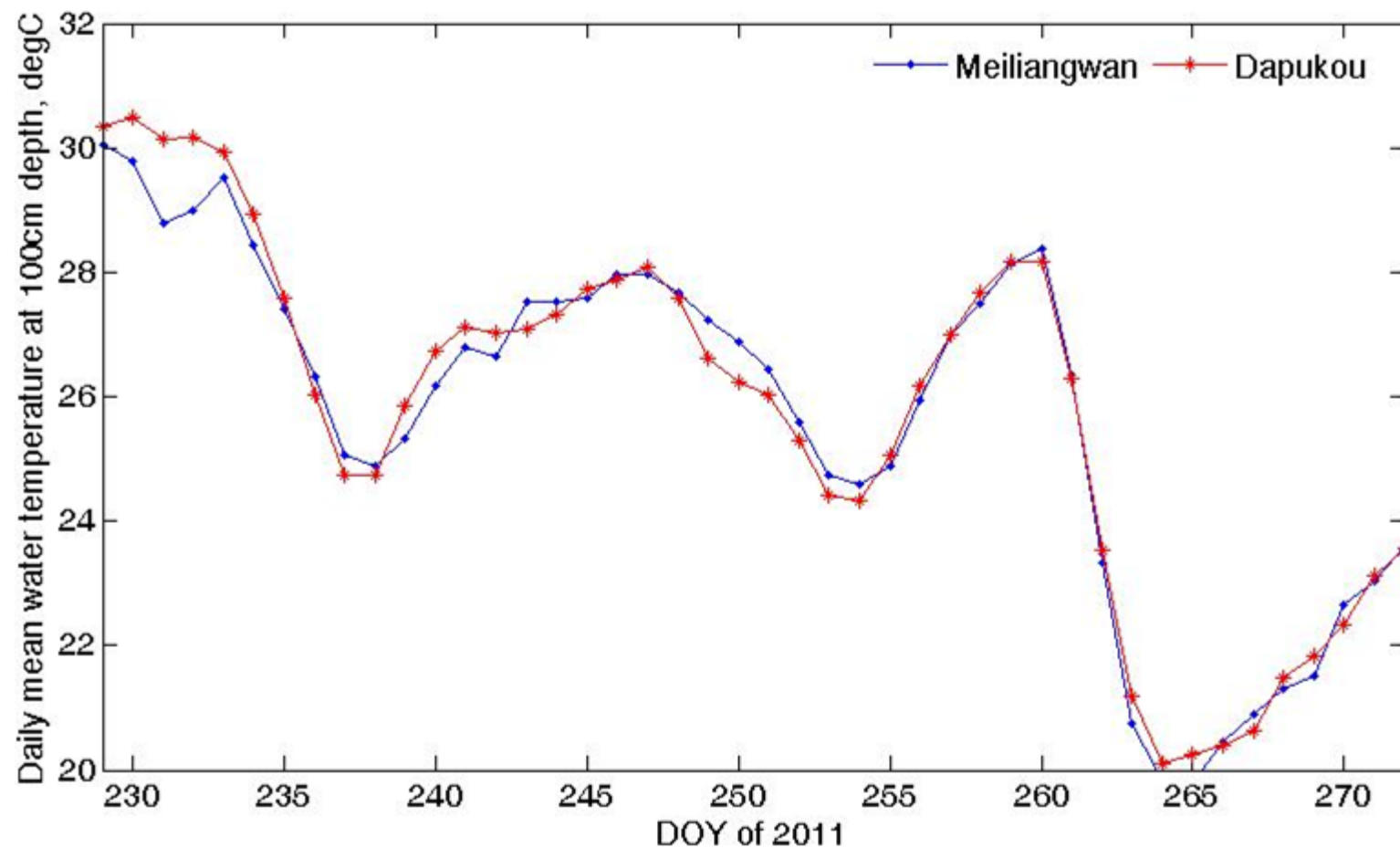
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Water temperature-daily mean at 50cm depth



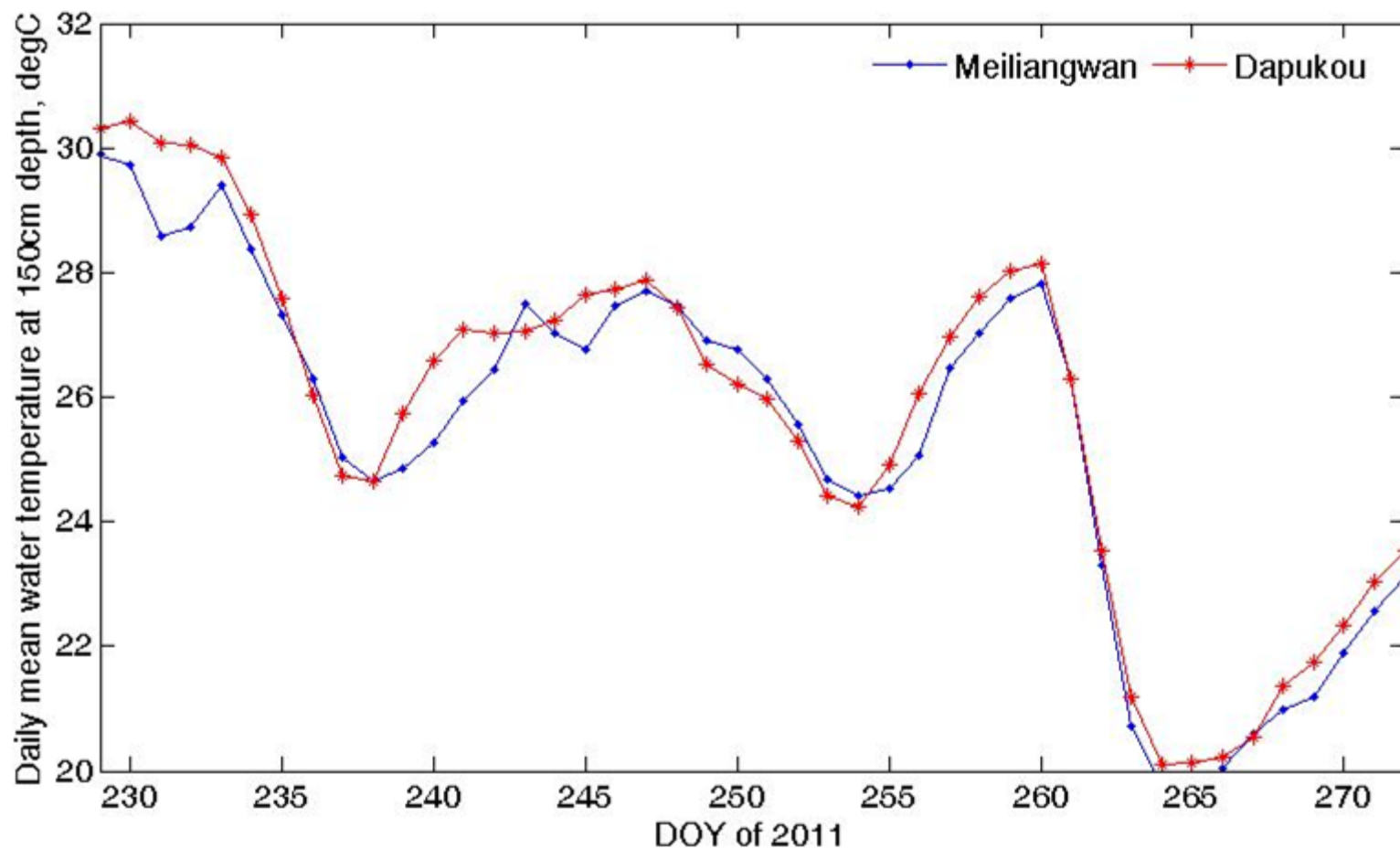
Water temperature-daily mean at 100cm depth



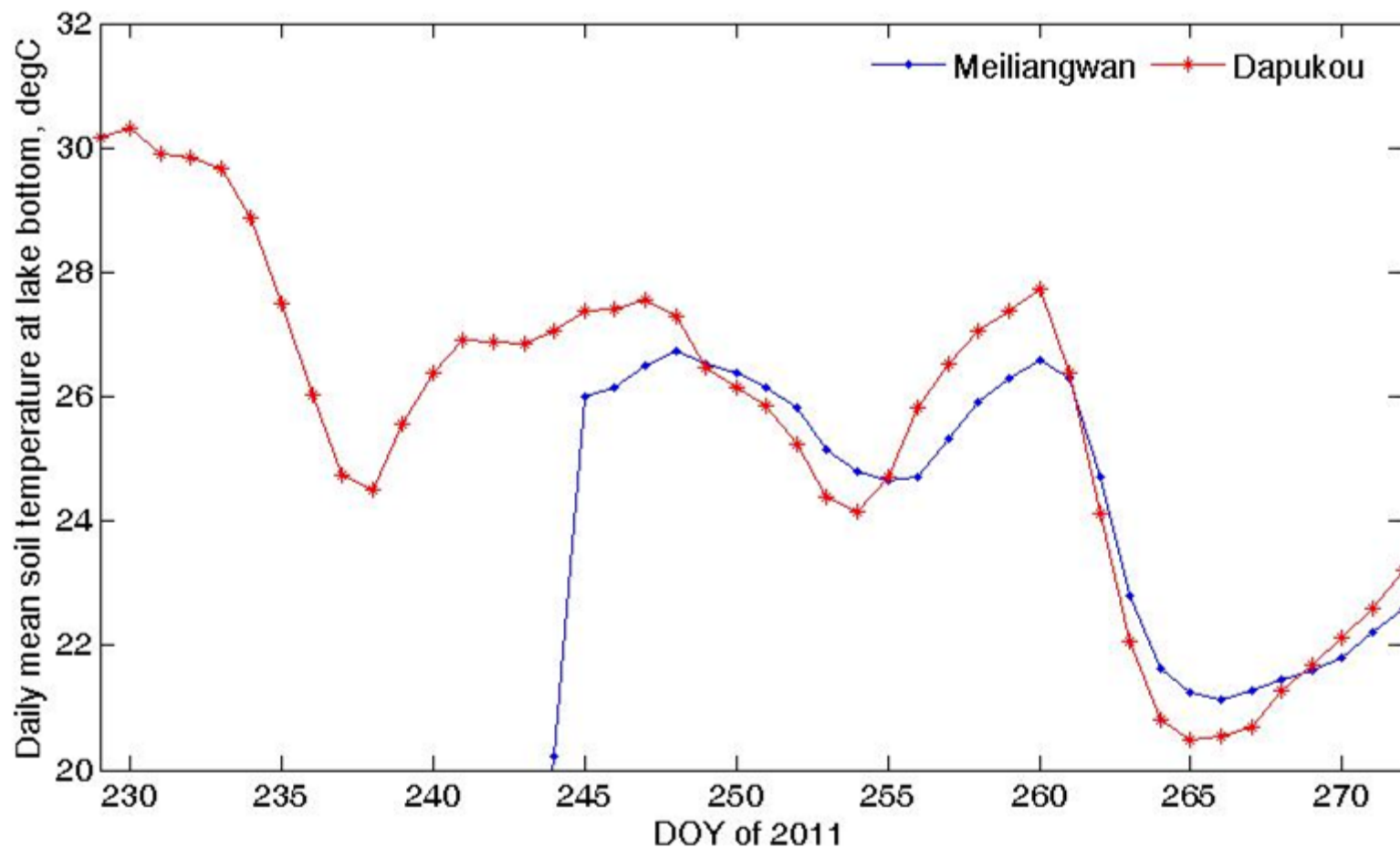
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Water temperature-daily mean at 150cm depth



Water temperature-daily mean at lake bottom



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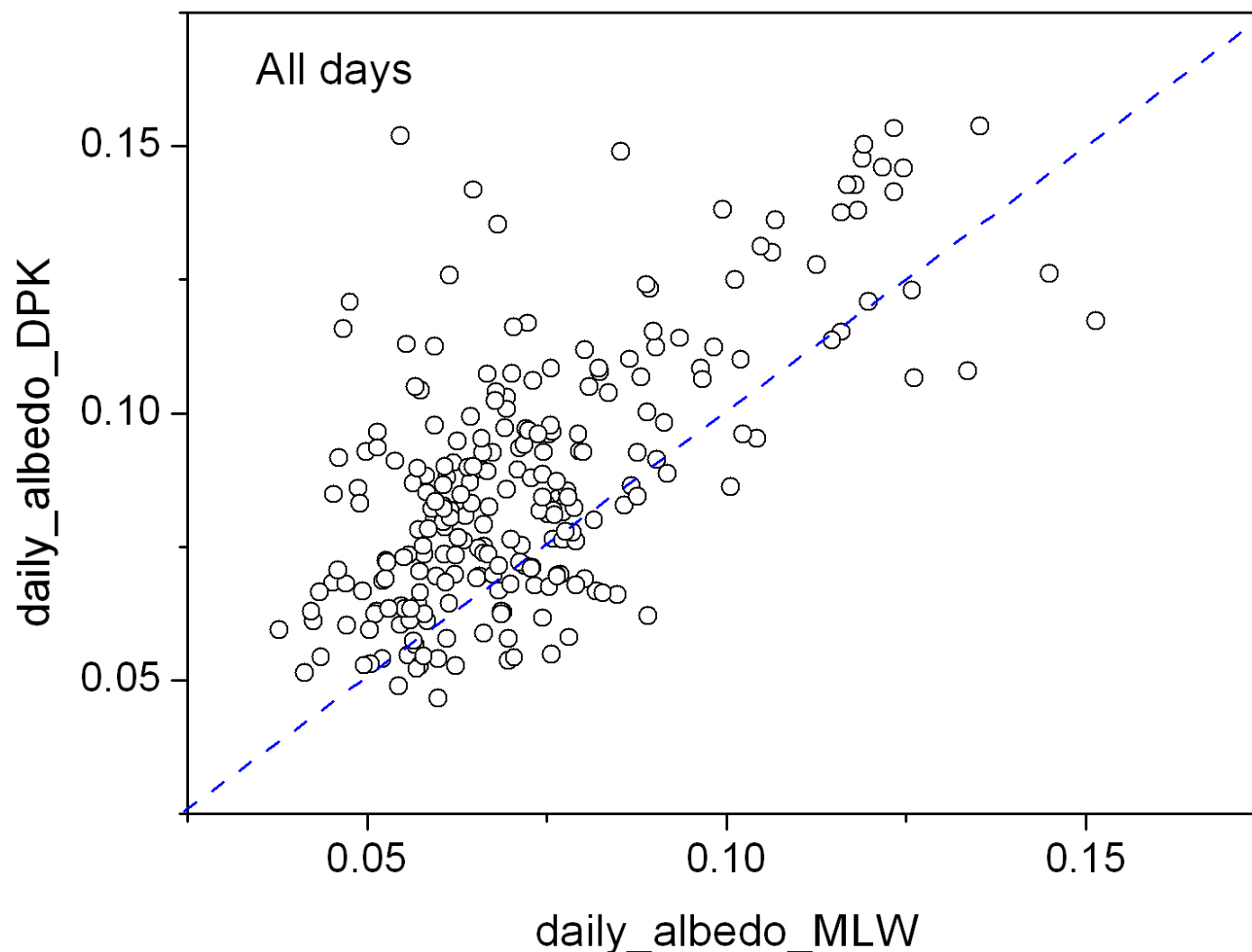
Investigating the wind speed effect on albedo



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Daily mean albedo-All days



Clearness index

$$k_t = \frac{S}{S_e}$$

- S : incident solar irradiance (W.m^{-2}) received by underlying surface ;
- S_e : the extraterrestrial irradiance (W.m^{-2});

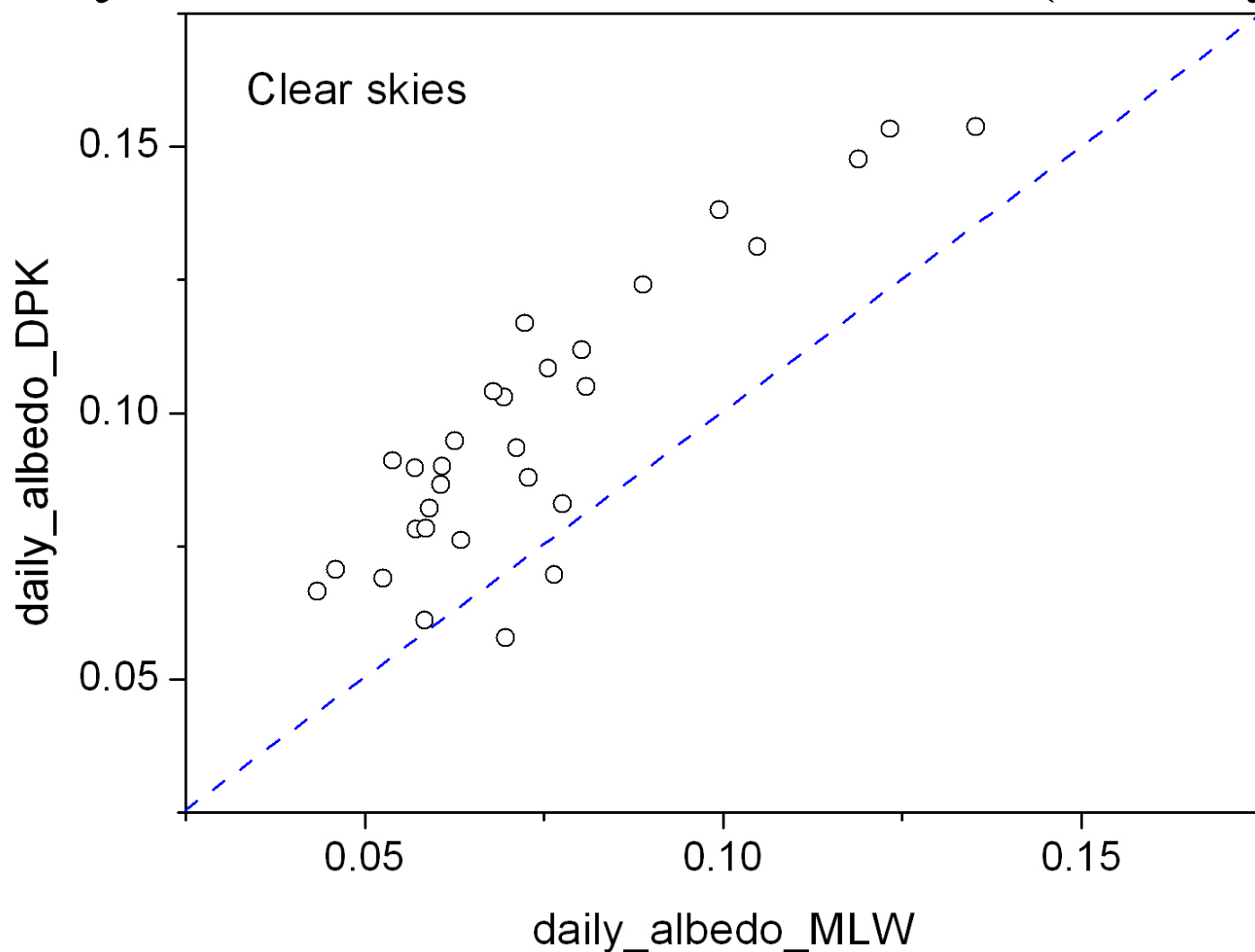
(Gu *et al*, 1999)



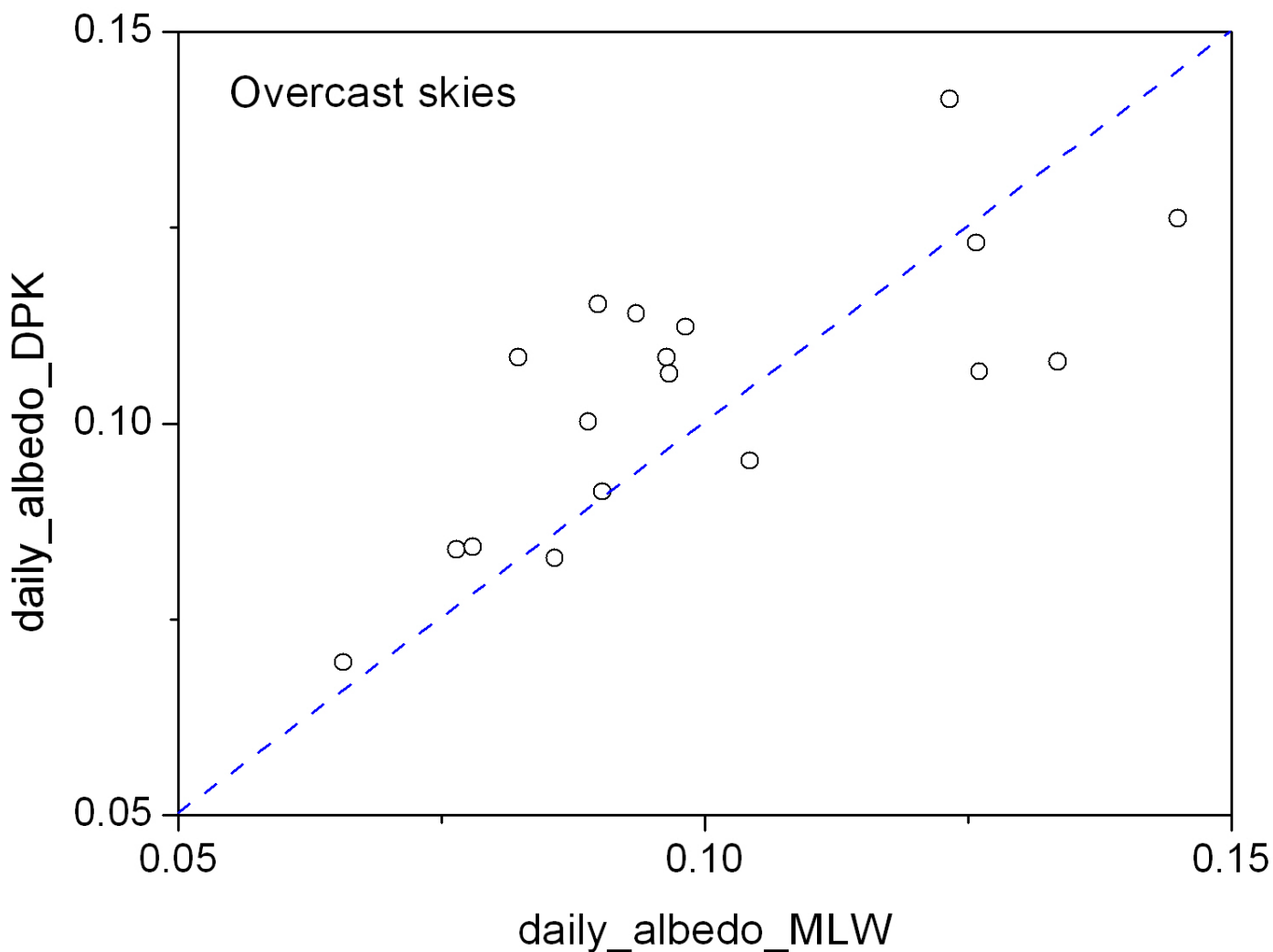
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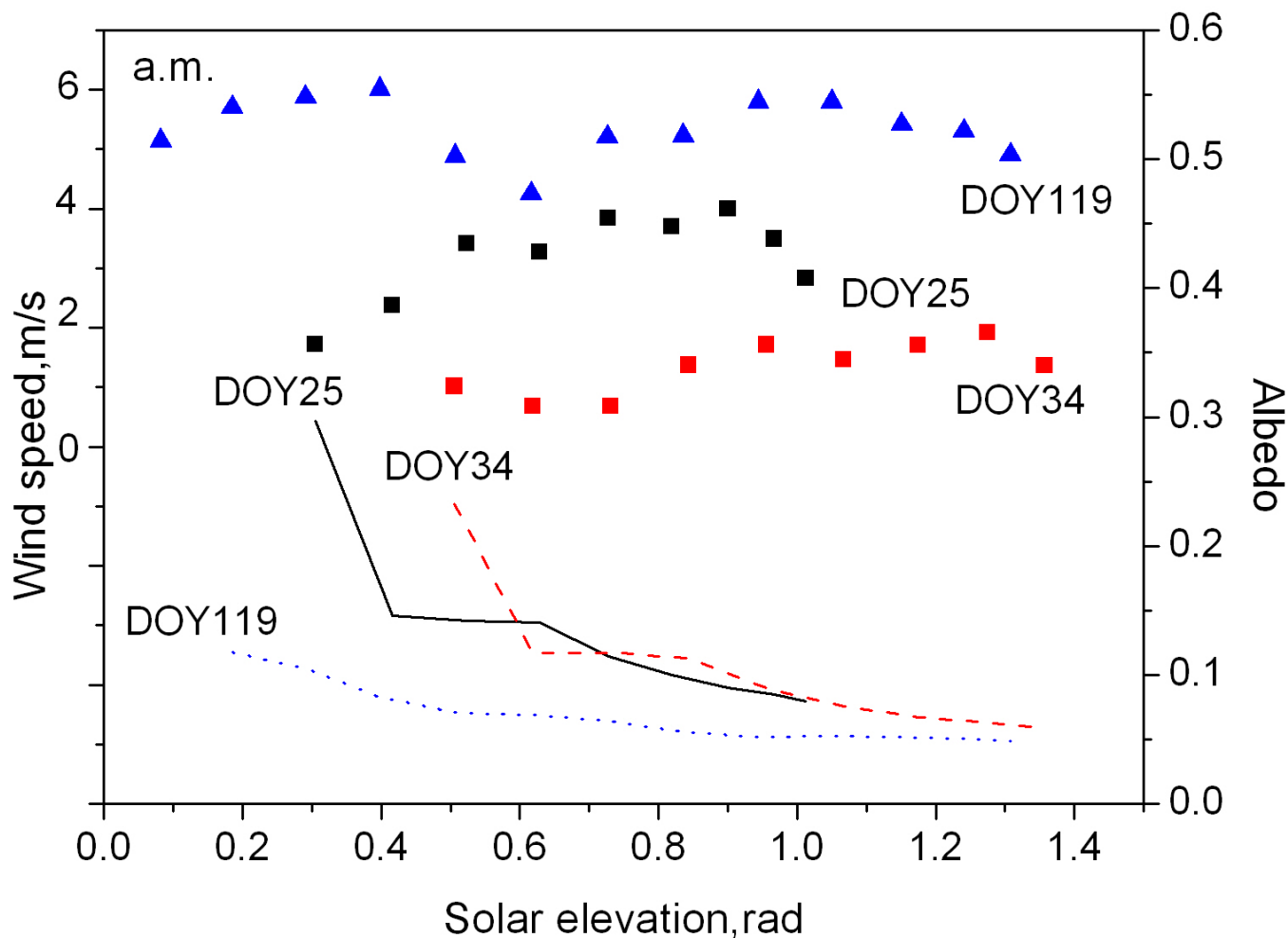
Daily mean albedo-Clear skies (30 days)

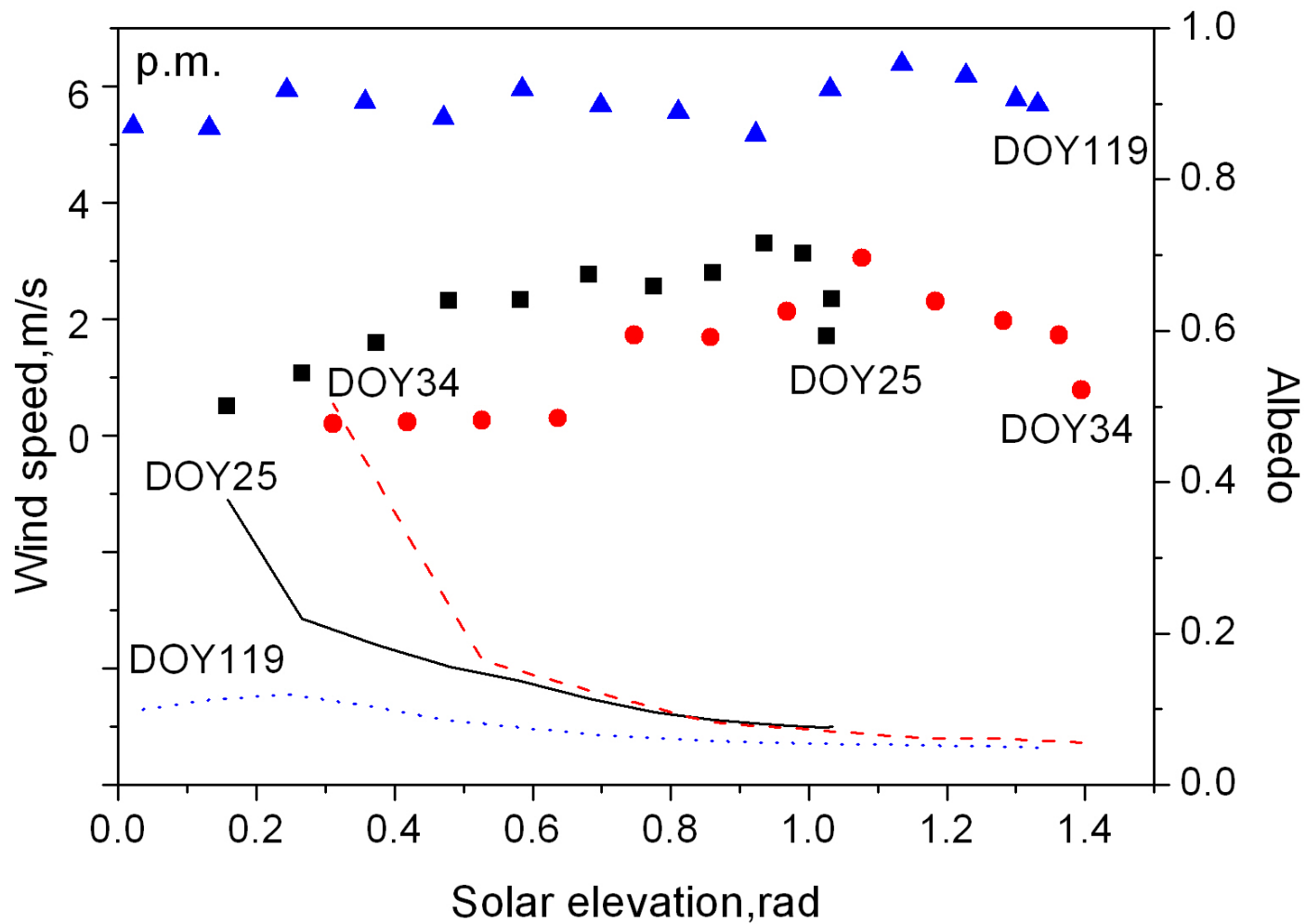


Daily mean albedo-Overcast skies (20 days)

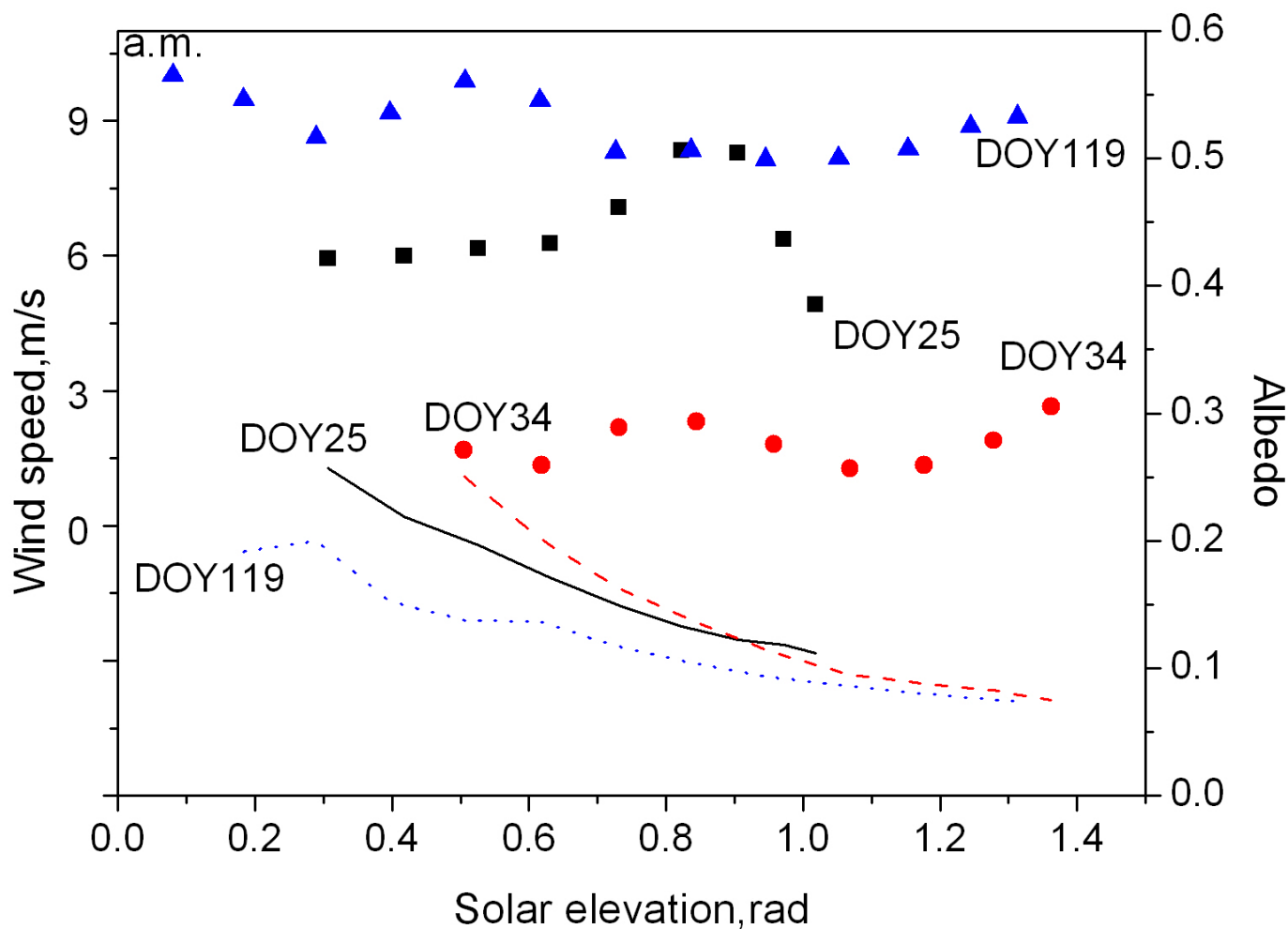


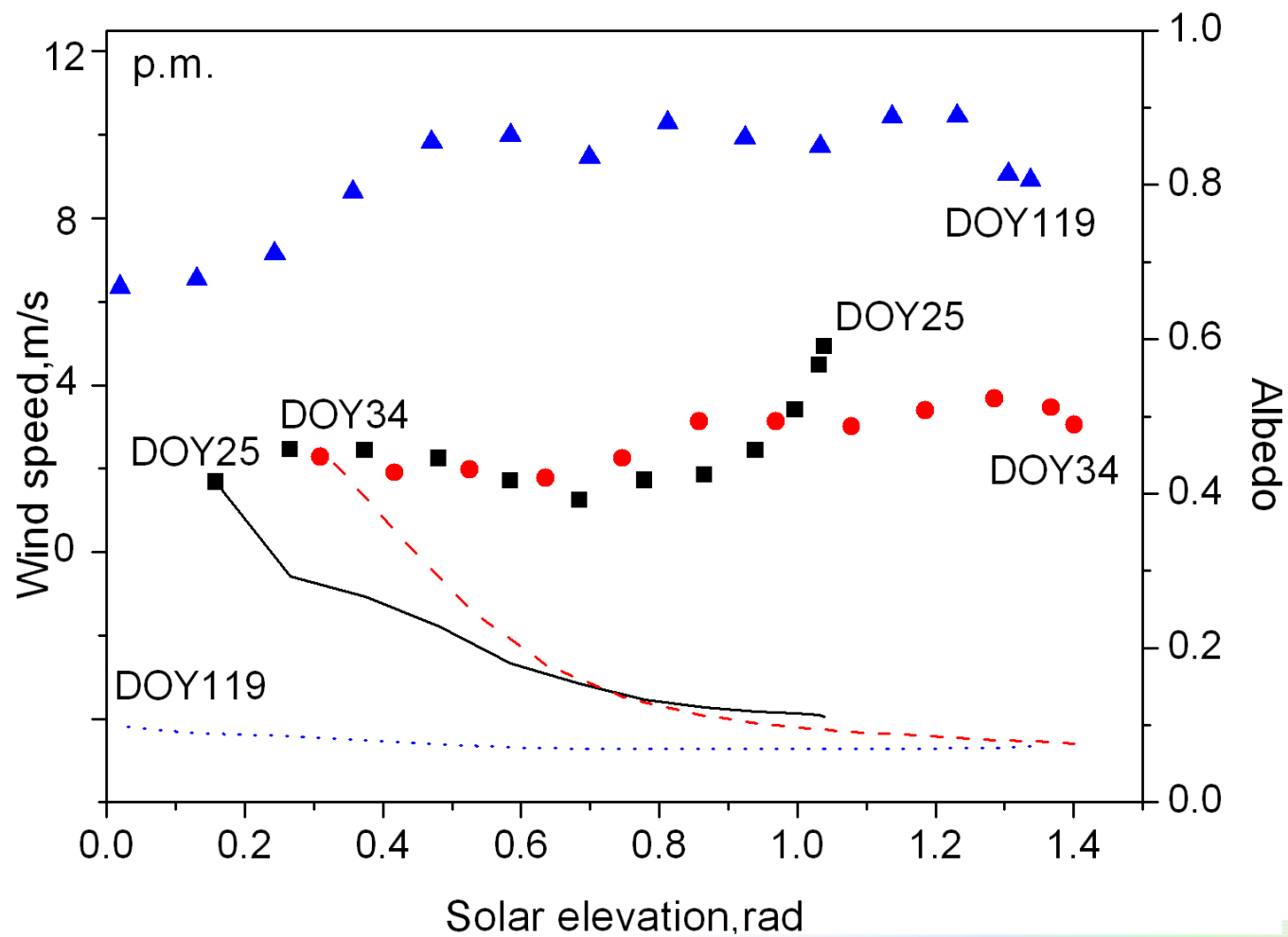
Clear skies-wind speed vs. albedo at MLW



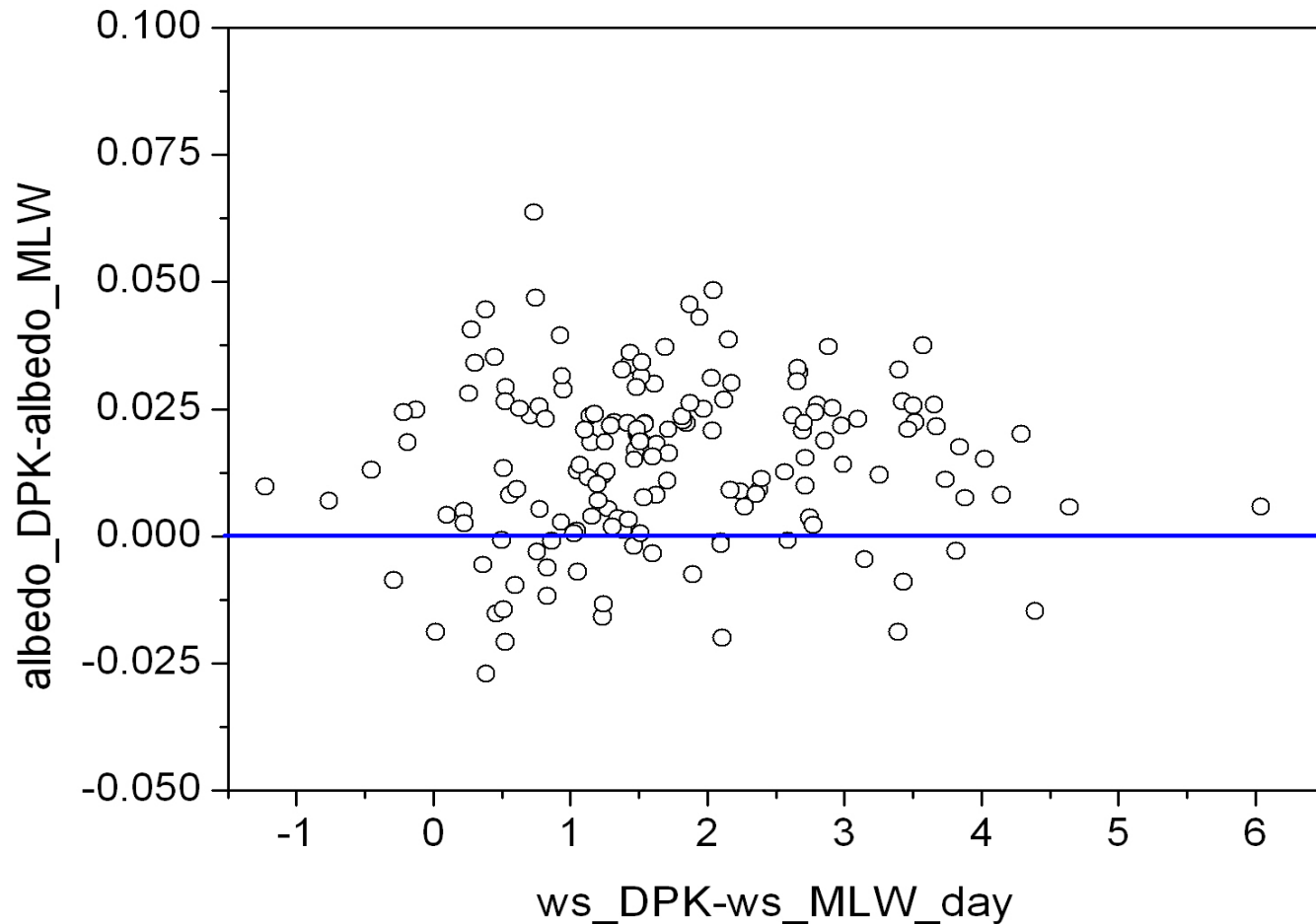


Clear skies-wind speed vs. albedo at DPK

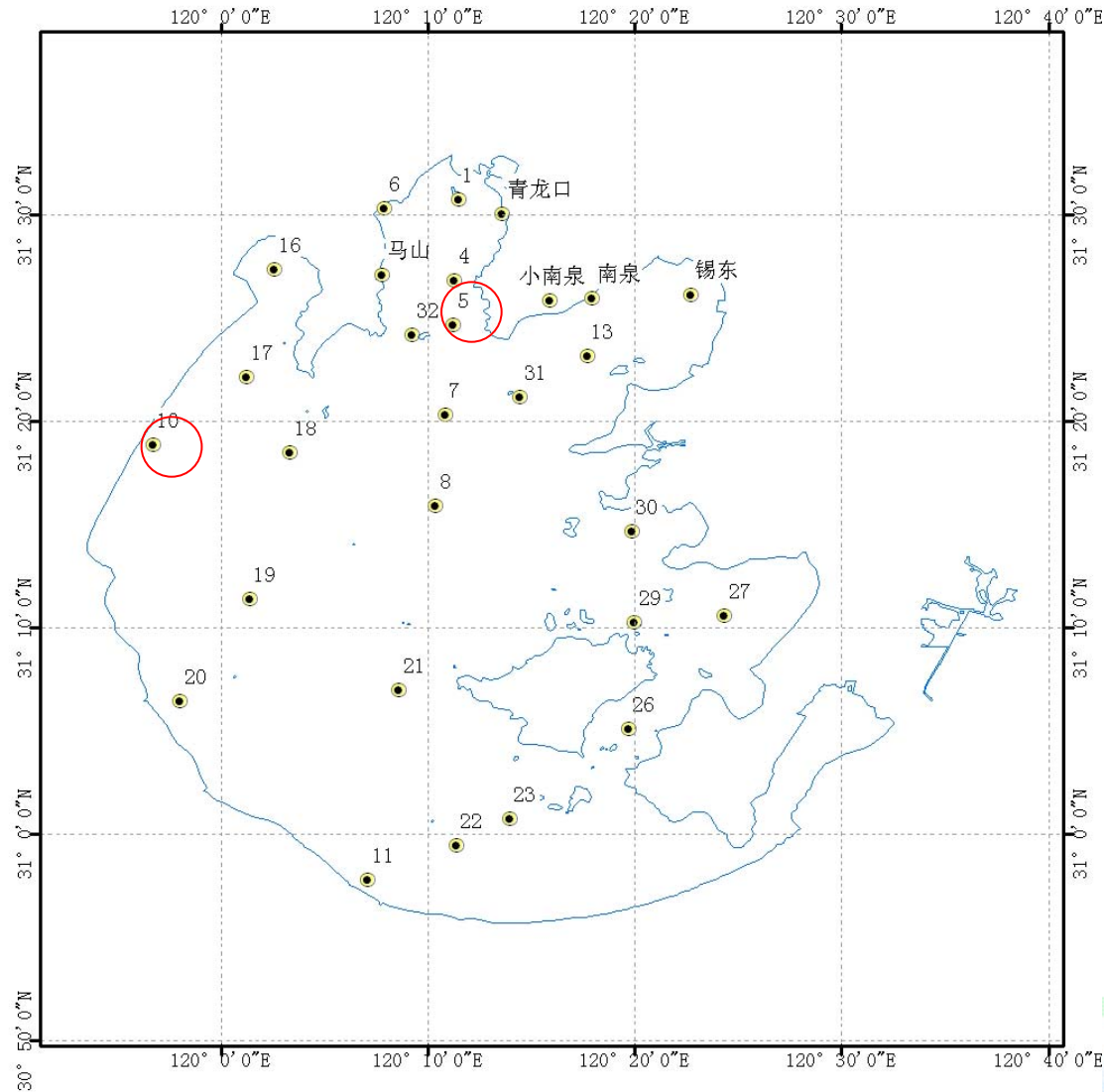




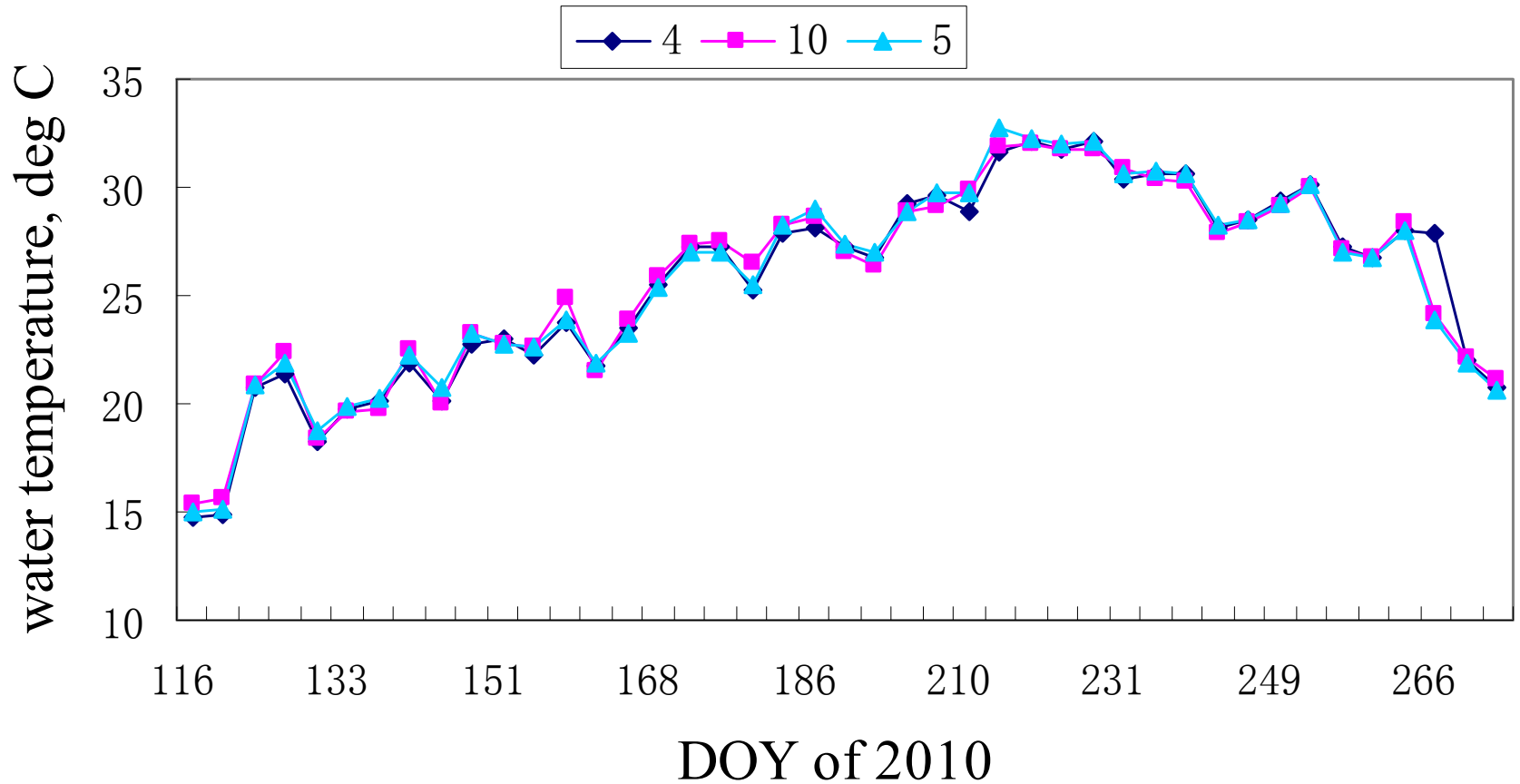
Daily mean wind speed vs. daily mean albedo



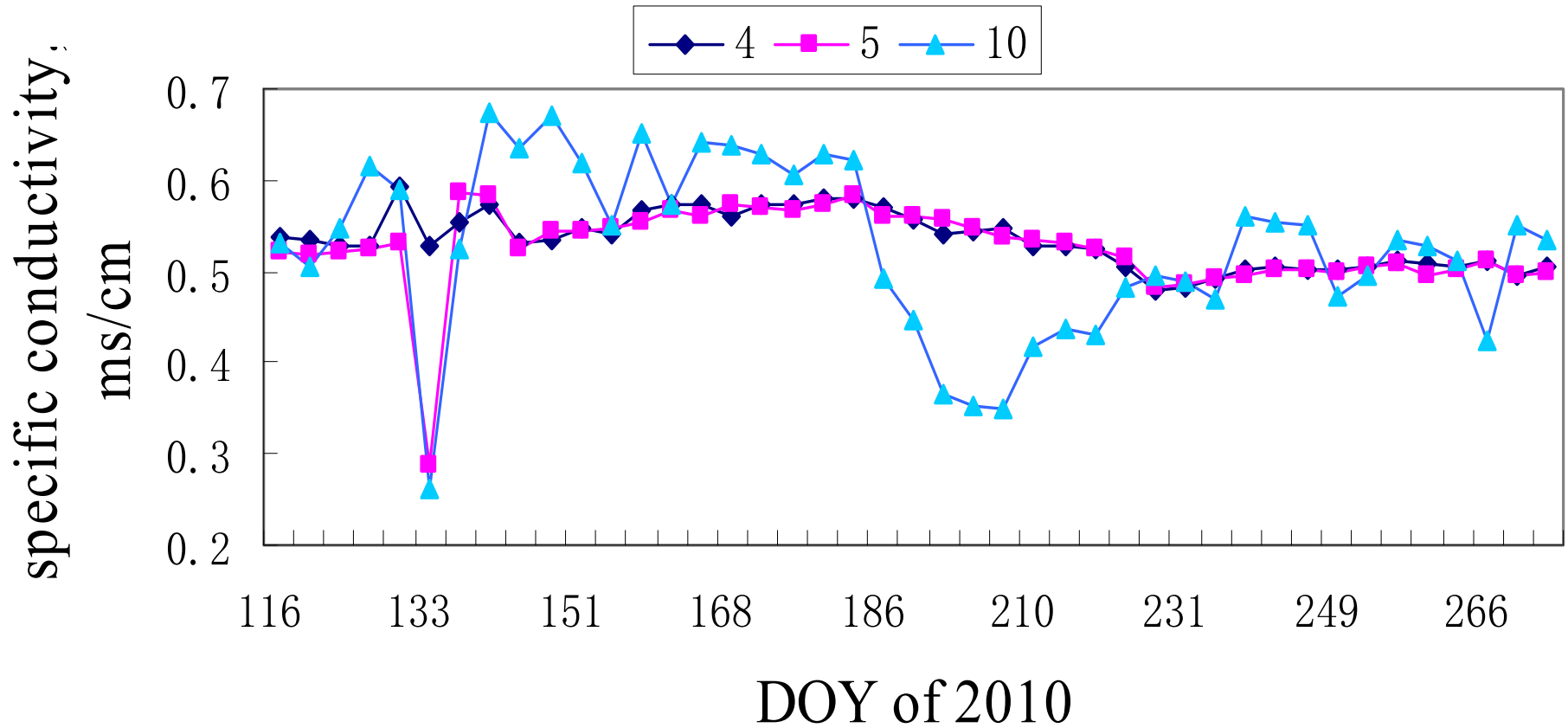
Dekad water quality measurement sites



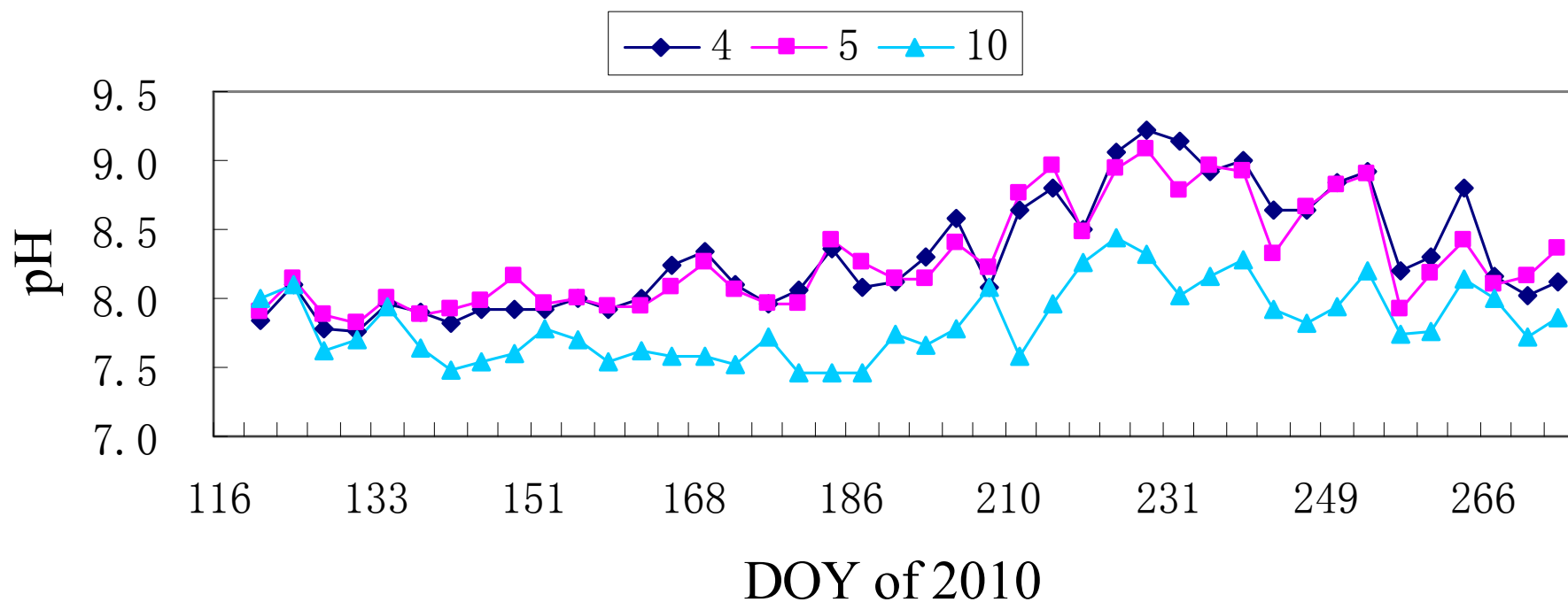
YSI-Water temperature



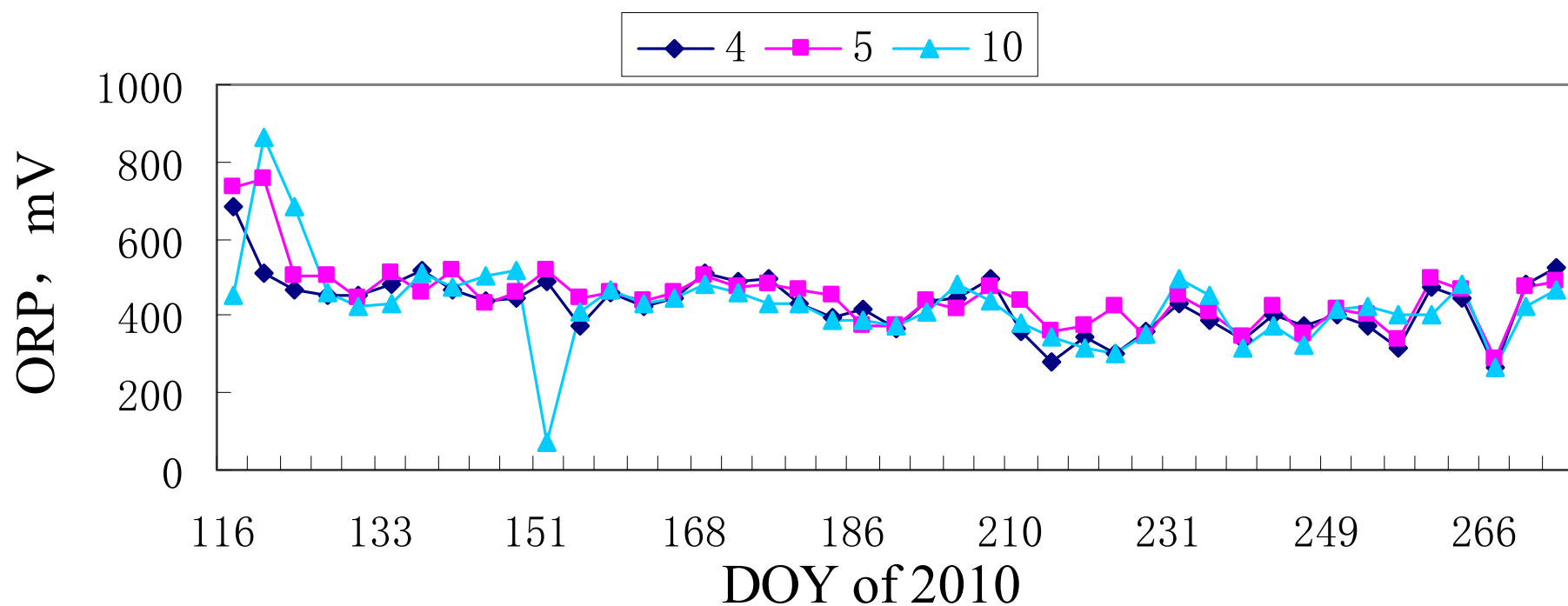
YSI-specific conductivity



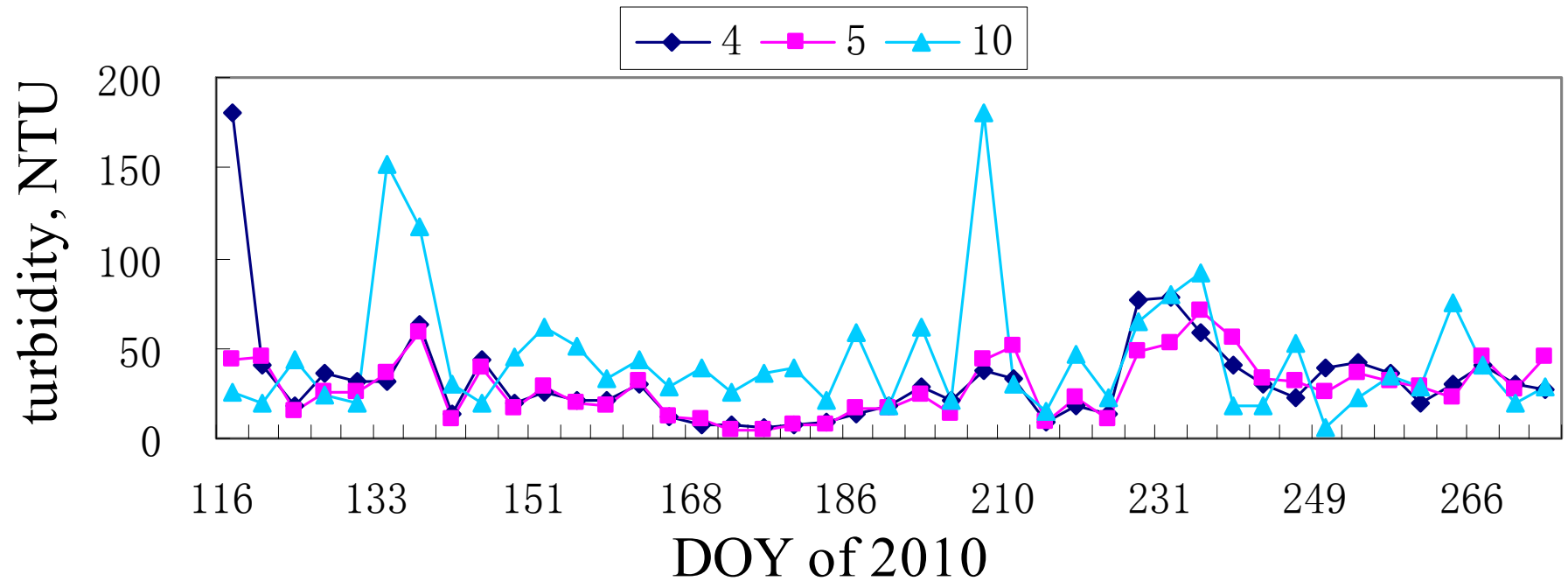
YSI-pH



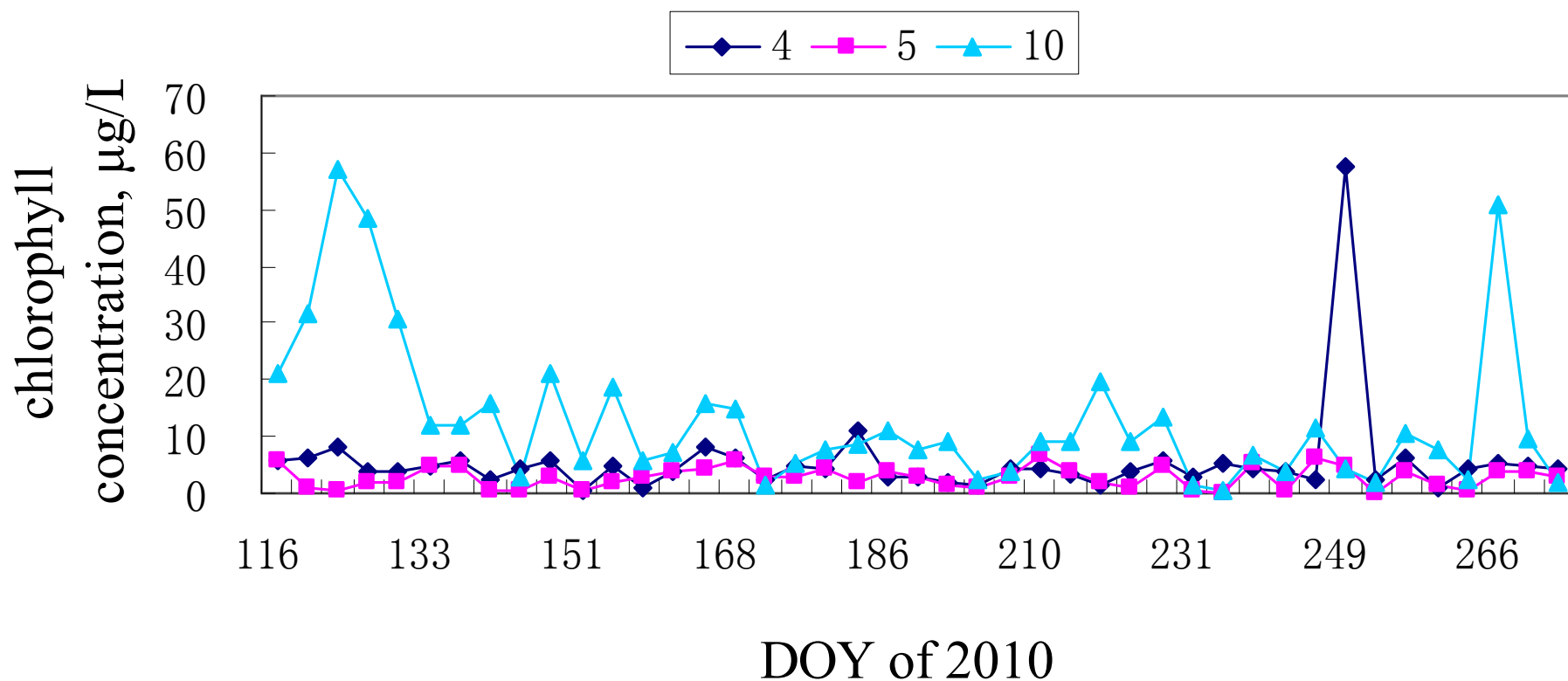
YSI-Oxidation-reduction potential (OPR)



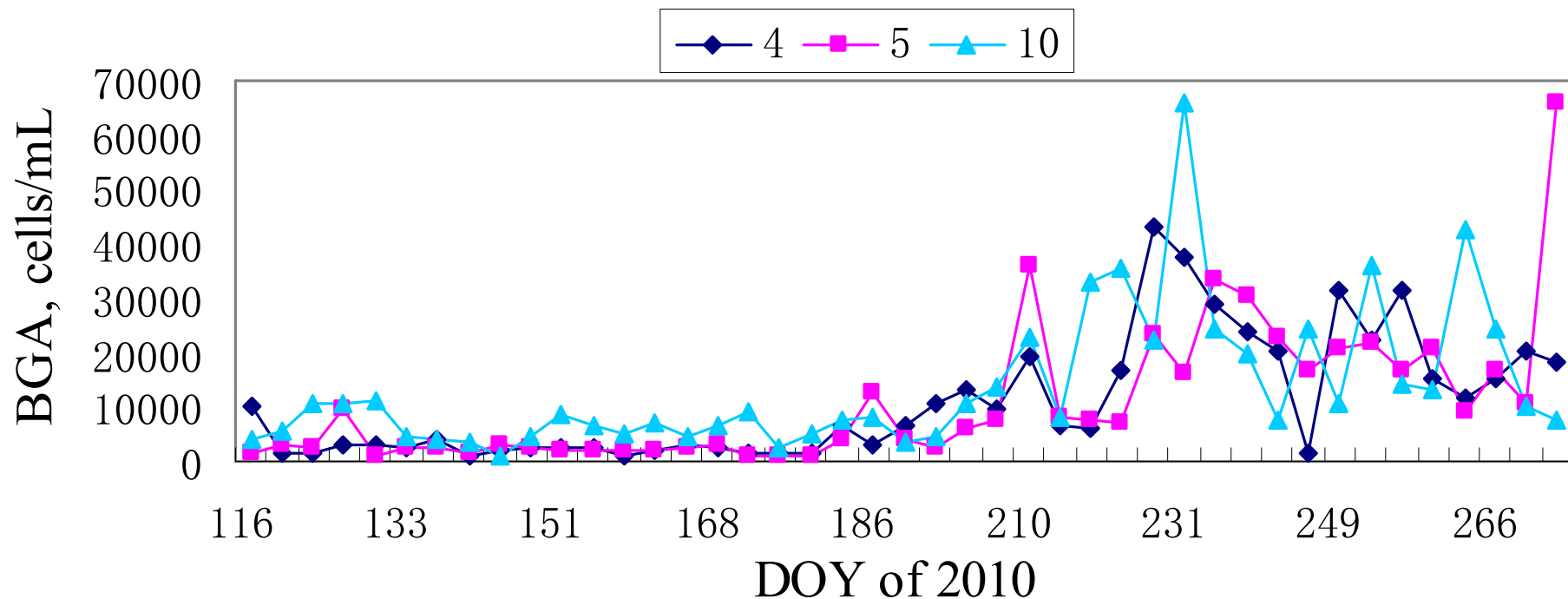
YSI-Turbidity



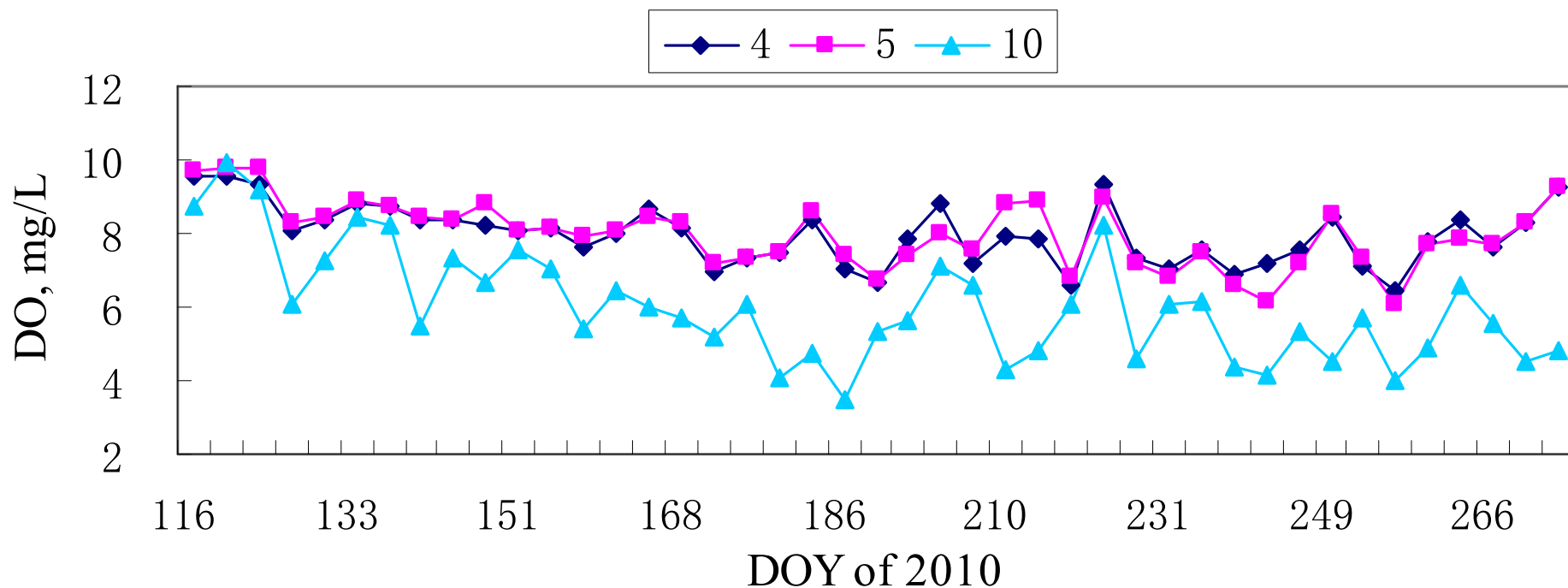
YSI-Oxidation-Chlorophyll concentration



YSI-Oxidation-Blue-green algae density (BGA)



YSI-Oxidation-Dissolved oxygen (DO)



4. Conclusion

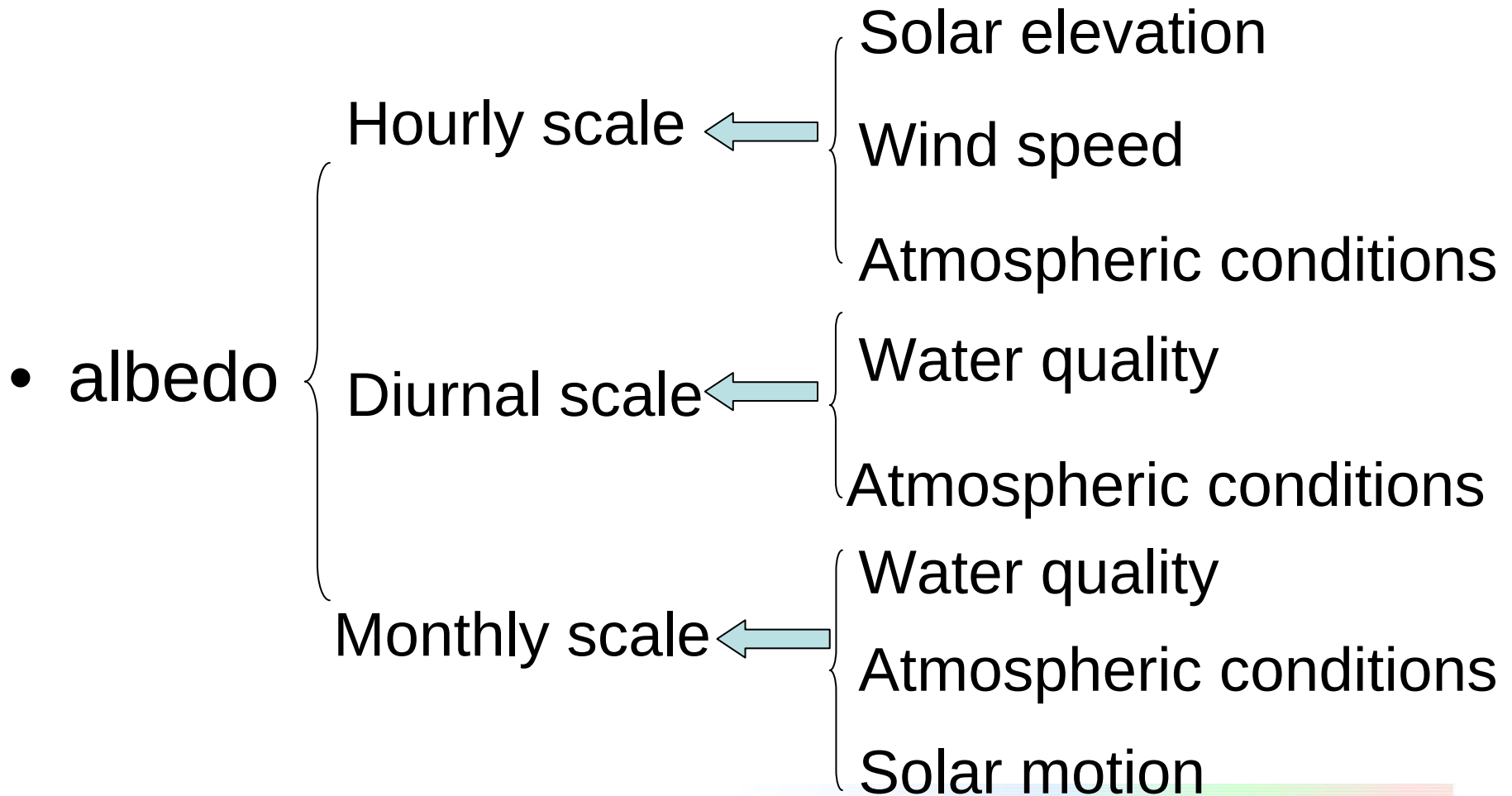
Parameters	Relationship
Sensible heat flux	$MLW \neq DPK$
Latent heat flux	$MLW \neq DPK$
NEE	$MLW \neq DPK$
CO ₂ concentration	$MLW < DPK$
Air temperature	$MLW \approx DPK$
Relative humidity	$MLW < DPK$
Wind speed	$MLW < DPK$
Precipitation	$MLW > DPK$
Reflected short-wave radiation	$MLW < DPK$
Incident short-wave radiation	$MLW \approx DPK$
Daily mean albedo	$MLW < DPK$
Upward long-wave radiation	$MLW \approx DPK$
Downward long-wave radiation	$MLW \approx DPK$
Water temperature	$MLW_variation > DPK_variation$



- With similar transmittance, high albedo corresponds to low wind at small to moderate solar elevation on hourly scale, but the phenomenon disappears when it comes to diurnal scale.
- The difference between daily mean albedo at MLW and DPK may comes from water quality difference.



5. Discussion



Look forward to your comments
and suggestions



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