

***Interactive comment on* “Effects of cloudiness on carbon dioxide exchange over an irrigated maize cropland in northwestern China” by B. C. Zhang et al.**

Anonymous Referee #1

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General comments:

Zhang et al. investigate the effect of diffuse radiation on photosynthesis. This is a relevant and important relation that is not yet fully understood. They use data of an agricultural ecosystem, that has so far not gained much attention with respect to the response to cloudiness.

The description in the methods part could be more precise, e.g. include the polynomial fit for GEP, vegetation type and species for the site characteristics.

In the results part it seems they use observations of the whole growing season to study the relation to meteorological drivers, this would mean they neglect the development

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of the vegetation. This might be the reason why they come to the strange conclusion that low VPD suppresses photosynthesis, while the opposite is usually found in papers as plants close their stomates for high VPD to decrease the water loss. Moreover it is not clear from the figure whether this effect is significant, for high and low radiation the results are opposite of what they write. Their results rather suggest that there is no influence of VPD on the carbon uptake.

Overall the paper does not improve our understanding as most results seem insignificant or confounded by other factors not accounted for.

Specific comments:

p. 1672, l. 5: give the vegetation type and main species.

p. 1674, l. 14: how do you get the S_f , the total diffuse radiation?

p. 1675, l. 11-13: this should be moved to the methods part

p.1675: l.18-20: how do you find that there is no saturation??

p. 1676: shouldn't the polynomial go through zero? For zero radiation also GEP should be zero. The polynomial equation doesn't seem to fit the data well, maybe a light response curve could serve better in this context.

p. 1677, l. 6: what is the optical temperature?

p. 1677, l.19, this effect seems not significant.

p.1678,l. 10, in figure 10 you don't remove the effect of radiation on NEE? Then the relation between NEE and temperature is confounded by this.

Technical comments:

p.1671, l 20: you mention studies but cite only one

p.1671, l. 29: change 'to investigated' into 'to investigate'

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