

Interactive comment on “Response of carbon fluxes to water relations in a savanna ecosystem in South Africa” by W. L. Kutsch et al.

Anonymous Referee #5

Received and published: 16 July 2008

This is a potentially important paper, which examines relationships between CO₂ fluxes and water conditions in a savanna ecosystem. I felt however there are deficiencies in the manuscript, which should be addressed:

1. The data shown in this manuscript are insufficient. At least, time courses of CO₂ fluxes (F_c , F_p , and F_r) and (air or soil) temperature should be illustrated in addition to the soil moisture.
2. Seasonal change in LAI is also necessary, since both of photosynthesis and respiration are affected by LAI. You should consider the water influence on the CO₂ fluxes separately from the amount of plant.

<Specific comments/questions> P. 2202, L. 11-25: Please add more information about

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the research site, such as latitude, longitude, canopy height and inclination of the slope at eddy covariance tower.

P. 2206, Eq. 4: What are "Fp,sat" and "TANHYP"?

P. 2207, L. 22 (Fig.2): Why did you show the soil moisture at only one site? You mentioned the soil moisture was different between the sites in page 2203. Were the data in Fig. 2 observed at the Acacia site or Combretum site? Please show the data at both the sites.

P. 2208, L.2-12: You compared Fc and Fp for only one period. How about the other periods?

P.2208, L.21-26: The sentences are unclear.

P.2209, L. 3 and L. 6: I cannot understand how Fig. 8c indicates the result in this paragraph.

P. 2210, L. 14-17: Please define the conductance sensitivity to VPD. You mentioned "Stomatal responses to environmental conditions were highest in January and March", whereas the c vales in these months were the lowest. This is very confusing.

P. 2212, L23-26: The sentence is unclear. I cannot understand why "it seems that different species optimize their fluxes"

P. 2213, L. 3: What is "Fp,max"? How did you estimate it?

P. 2225 and 2226: In Fig. 1, no rain observed in June 2003, but the soil moisture in Fig. 2 showed an obvious increase during June. Please check the data.

P. 2228, Fig. 3: Please specify the values of soil moisture for each of the wet, medium and dry soils.

<Minor Edits> P. 2204, L. 21: Change "3.0 nm" to "3000 nm"

P. 2205, L. 18: What are "t0" and "t-1"?

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P. 2206, L. 21: "Eq.4"? Maybe "Eq.5".

P. 2207, L. 3 and L. 7: Change "mbar" and "kPa" to "hPa".

P. 2209, L. 16 and Eq.10: Change "RWSC" to "RSWC".

P. 2210, L. 14: Reword "environmental conditions" to "VPD".

P. 2210, L. 25: Change "(5)" to "(6)".

P. 2211, L. 15: Again change "Eq.5" to "Eq.6"

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