True eddy accumulation - Part 1: Solutions to the problem of non-vanishing mean vertical wind velocity

The manuscript forms the 1ˢᵗ part of the revised duo of papers on the improvements to the true eddy accumulation method. This part deals with the correction for the non-zero mean vertical wind, which the authors conceptualize as α_c. Several formulations of α_c are compared, deriving it from the standard vertical exchange equation, quadrant analysis and on analytical grounds. Convincing evidence of the effectiveness of this approach to analyze and reduce the uncertainty in TEA flux is presented. The previous comments have been taken into account.

I therefore propose that this manuscript be accepted, given that the below minor changes will be made.

Abstract, line 1: I think it's worth making this very specific – the TEA measures vertical turbulent exchange between the ecosystem and the atmosphere.

Line 7: the mention of advection comes too suddenly, I think this needs to be preceded by a sentence leading up to this idea.

The last sentence of Abstract should be revised, it doesn't read well.

Line 54: the sentence should be rewritten, I do not understand it.

111: "tilted coordinates" sounds too colloquial – perhaps rephrase as "non-alignment of the anemometer with the local topography" or something similar, depending what you mean. Likewise, the instruments you mean here are probably the anemometers.

114: need -> needs

Section 2.3. Since you are discussing the effect of coordinate rotation, you could mention the sector-wise planar fit method, which considerably improves the results compared with the use of a single plane.

Line 200: but deviations from Gaussian behavior may be expected given the various complications you listed above, most prominently the complex topography. Thus, the analytical solution should maybe be taken with caution.

244-252: I do not insist, but I think it would have been very illustrative to provide an extra figure showing time series of the three terms comprising Eq. 14 separately, so their relative size can be judged as it changes diurnally.

271: so is this due to the imperfect normality of the data?

Figure 2: the neutral cases are very difficult to see, consider changing the markers.

293-294: "indicates"

309: "poor proxy"