Response to Referee #1

We thank Referee #1 for the comment. It is clear from the comments that further clarification is needed.

The underlying reason for the covariance correction terms to occur emerges mainly from the diurnal variation of wind speed, the vapour pressure of the evaporating surface and the air vapour pressure. The key towards accurate estimates of the scaling correct ion is to properly capture the diurnal cycle of these variables.

Figure A was prepared to pinpoint the underlying reason for covariance correction at our study site. The exact correlation between wind speed and the temperature of the evaporating surface might be unique to our study site but the general principle that the nature of the diurnal cycle is important is generic. In that respect we believe it is useful to include Fig. A to show where these covariances actually come.

We subsequently classified all 237 days into one of four seasons. (That is what we meant by the super-year, i.e., we ignore the fact that the data come from different years.) The basic logic is that a typical seasonal diurnal cycle may well be sufficient to calculate an accurate (enough) covariance correction. We then wanted to assess how many days we needed to make an accurate (enough) seasonal correction. In Figure B, the x-axis represents the number of days used (from left to right: 1 day, 2 days, 4 days, … 64 days) to obtain a single mean diurnal cycle for each of the three key variables (i.e., wind speed, vapour pressure of the evaporating surface and the air vapour pressure). Following that, a single total correction factor was calculated from the scaling corrections arise from these mean diurnal cycles. For instance, when "1 day" is used to calculate the total correction factor, we use all days individually and the 64 total correction factors (= $1 + \chi_{All}$) correspond to 64 days. When "2 days" are used to calculate the mean diurnal cycle, we combine 2 consecutive diurnal cycles into one single mean diurnal cycle and have 32 total correction factors correspond to 32 days. This process is continued until we have "64 days" used to get a single mean diurnal cycle with only one total correction factor that is applied to all 64 days.

The accuracy of the "1 day" case is the highest because each of the 64 days used their own total correction factor to compare with the observed pan evaporation. The accuracy of the "2 days" case has slightly reduced because there are 64 days using the 32 total correction factors. With more days used to form a single mean diurnal cycle, the less total correction factors are available and thus lower accuracy as more days are sharing the same total correction factors. On the other end of the spectrum, the "64 days" case has the lowest accuracy since there is only one total correction factor to be shared by all 64 days. Those results showed that a mean diurnal cycle calculated using around 15 days gave similar results to one calculated using 64 days. This means that the data requirements for estimating a diurnal cycle are not onerous.

We plan to elucidate this in the up-coming revision of the manuscript.