Interactive comment on "The Niwot Ridge Subalpine Forest US-NR1 AmeriFlux site – Part I: Data acquisition and site record-keeping" *by* S. P. Burns et al.

Information Related to Time Stamp Differences

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Date: August 8, 2016

Since submitting the original manuscript, we have examined the time difference between measured samples for all the input channels. As a typical example, Fig. R1 at the end of this comment shows the time difference between adjacent samples for the three 10-Hz CR23X data loggers measured by the Titan DSM over a 24 hour period. Similar plots for three of the 1-Hz CR23X data loggers are shown in Fig. R2. At the US-NR1 tower during this time we had a similar data system making serial measurements from seven different CSAT3 sonic anemometers at 30 samples per second. The time-difference plots for three of the CSAT3 sonic anemometers are shown in Fig. R3.

The interesting feature shown in Figs. R1–R3 is that even though very few samples are missing, the delta time between data samples varies. For example, for the 10-Hz channels the time difference typically varies between 0.09 sec and 0.11 sec (Fig. R1). The frequency distributions are included to emphasize that most (around 80-90%) of the data collected are within ± 0.001 s of the desired time difference so the time series plots can be a bit misleading to the eye. This is especially true for the 10-Hz and 1-Hz CR23X data loggers, but the frequency distribution for the serial CSAT3 output shows two peaks, one at 0.03 s and one near 0.04 s. Because relatively few data samples are missing, we suspect the data loggers and CSAT3s are outputting the samples at the required sample rate. The variations in time stamp differences are most likely due to the buffers and interrupts within the serial chip of the Titan and Viper DSMs which cause short delays in the time-tagging of the incoming serial data samples. These processes cause the DSM to constantly be either speeding up or lagging slightly to catch up with the incoming serial data stream. This can be observed by noting that the 30-Hz CSAT3 data are transferred to campus each day (via rsync) at 18:00 MST which is exactly when there is a disruption in the time stamp differences (at 27.75 MST decimal day of year) for all the CSATs (Fig. R3).

We are still discussing various aspects of these plots. However, because this topic seems like a relevant part of the data collection, we plan to include a plot and short discussion of this topic within our revised manuscript.

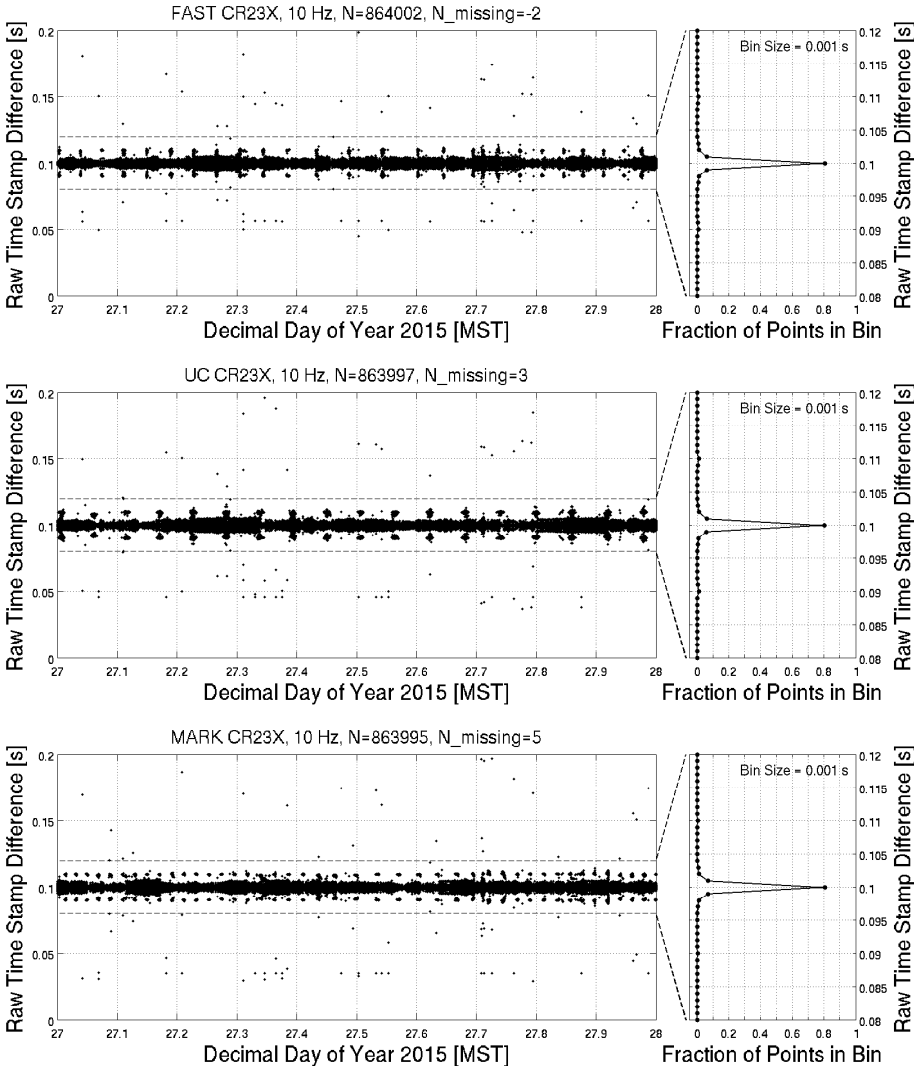

Figure R1: An example time series from 27 January of 2015 of the time difference between 10-Hz samples from the three CR23X data loggers as sampled by the Titan PC/104 computer (isffa) running NIDAS. The CR23X name is given in the title of each panel. To the right of the time series is a frequency distribution showing the number of samples within each time-difference bin. The dashed lines show the time-difference range used for the frequency distribution plot.

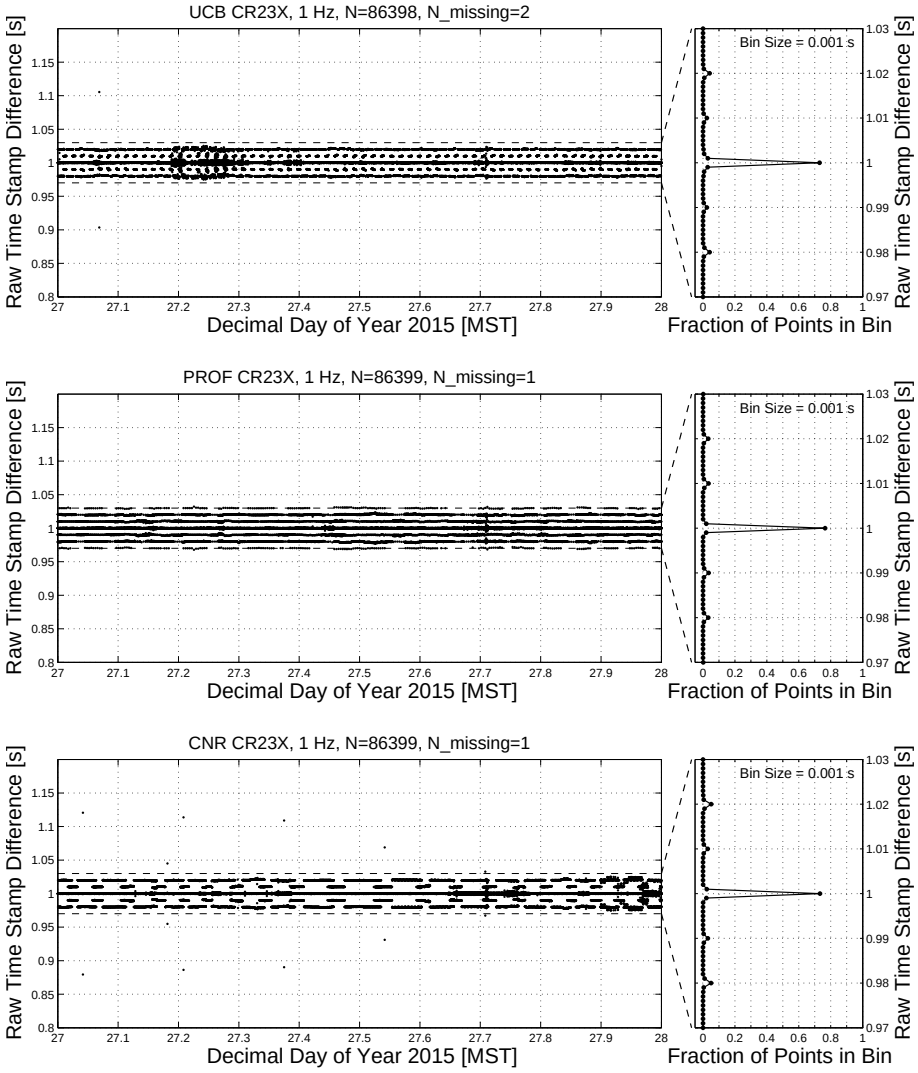

Figure R2: As in Fig. R1, except for three of the 1-Hz CR23X loggers.

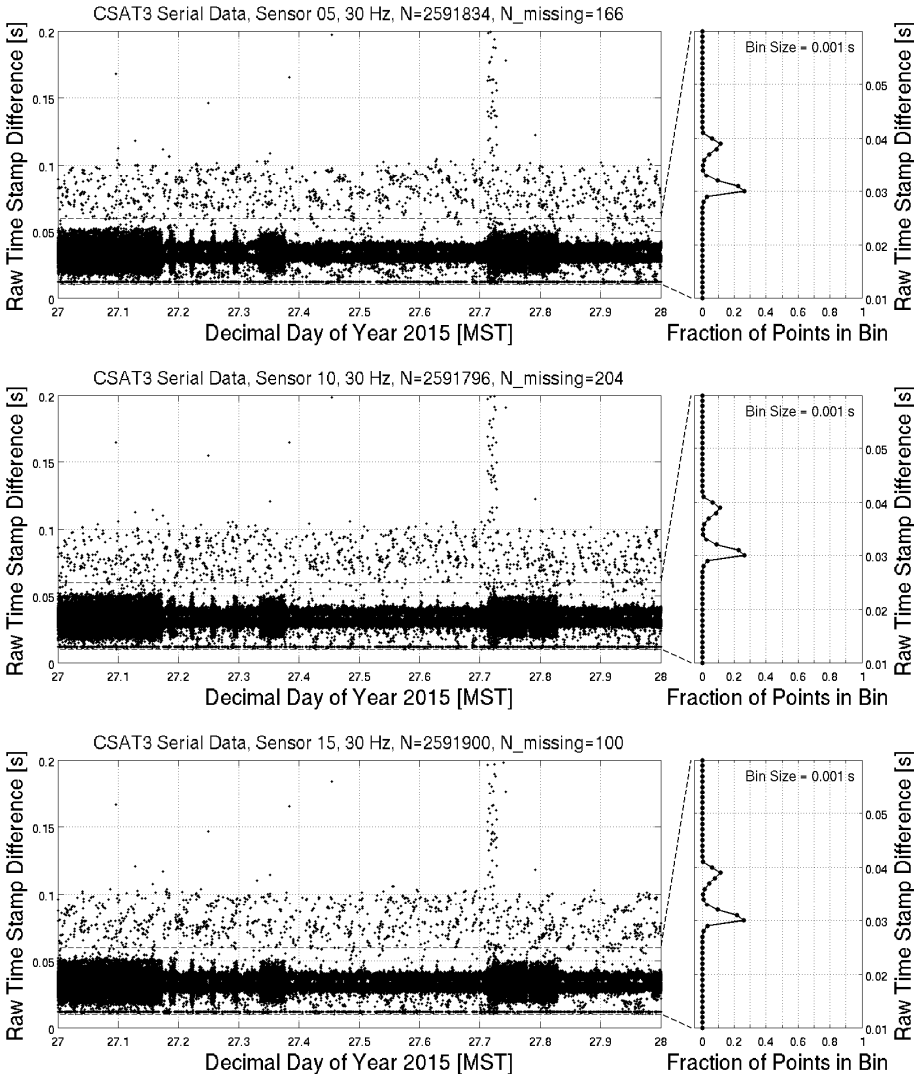

Figure R3: Similar to Fig. R1, but here we show the time difference between 30-Hz samples from three different CSAT3 sonic anemometers whose serial output was sampled by a Viper PC/104 computer running NIDAS.