



National Transportation Safety Board

Office of Aviation Safety
Washington, D.C. 20594-2000
December 18, 2017

ATTACHMENT 5 to the METEOROLOGY FACTUAL REPORT DCA17FA076

Comparisons of the ASOS and RWIS 5R/TD RPU wind data sets for the time period 0703-1158 EST on the accident day.

Figure 1 compares the ASOS two-minute average wind magnitudes with the RWIS 5R/TD RPU two-minute average wind magnitudes. Because the RWIS 5R/TD RPU only reported every five minutes, only ASOS two-minute average wind magnitudes that reported at the same times were used. RWIS 5R/TD RPU average wind magnitudes were converted from mph to knots.

Figure 1 also compares the ASOS two-minute average wind directions with the RWIS 5R/TD RPU two-minute average wind directions¹. Because the RWIS 5R/TD RPU only reported every five minutes, only ASOS two-minute average wind directions that reported at the same times were used. RWIS 5R/TD RPU average wind directions were converted from degrees magnetic to degrees true (there is a negative magnetic declination of 6° at YIP). Because the

Figure 2 compares the ASOS wind gust magnitudes directions with the RWIS 5R/TD RPU wind gust magnitudes. ASOS wind gust magnitudes are plotted every minute. Because the RWIS 5R/TD RPU only reported the maximum wind gust magnitude for the previous 10 minutes at five minute intervals, the maximum wind gust for each 10 minute period is plotted. This is shown by the red lines in figure 2, each of which span a 10 minute period (the 10 minutes leading to the actual report time). Because a new “10 minute line” is drawn every five minutes, overlap always occurs. When consecutive RWIS 5R/TD RPU wind gust magnitude reports are identical, this can create what appears to be a single line that spans more than 10 minutes.

¹ RWIS 5R/TD RPU two-minute average wind directions were only reported in five degree increment, which indicates these values were likely rounded off to a value +/- 2.5 degrees from the actual observed value.

Figure 3 presents, for each observation time plotted in figure 1 (every five minutes), the ratio (expressed as a percentage) of the RWIS 5R/TD RPU two-minute average wind magnitude to the ASOS average wind magnitude (e.g., a value of 80% indicates that the RWIS 5R/TD RPU two-minute average wind magnitude was 80% of the ASOS average wind magnitude at that observation time). Figure 3 also presents, for each observation time plotted in figure 1 (every five minutes), the difference between the RWIS 5R/TD RPU two-minute average wind direction and the ASOS average wind direction (e.g., a value of 15 would indicate that the RWIS 5R/TD RPU two-minute average wind direction was 15 knots less than the ASOS average wind direction at that observation time).

In addition, figure 3 presents the ratio (expressed as a percentage) of the maximum RWIS 5R/TD RPU wind gust magnitude to a maximum ASOS wind gust magnitude. Ratios are calculated every five minutes and consider the maximum RWIS 5R/TD RPU wind gust magnitude for the previous 10 minutes (which is reported at that time) along with the maximum ASOS wind gust magnitude reported over the previous 10 minutes. Thus, each ratio is plotted at the time the maximum RWIS 5R/TD RPU wind gust magnitude is reported, not necessarily the time the applicable ASOS wind gust magnitude observation was made. For example, a value of 82% at 0723 EST indicates that the maximum RWIS 5R/TD RPU wind gust magnitude for the time period 0714-0723 EST (reported at 0723 EST) was 80% of the maximum ASOS wind gust magnitude reported during the period 0714-0723 EST (but actual time of the maximum ASOS wind gust magnitude is not presented).

The following simple averages (rounded) were calculated over the time period:

- Average ratio of the RWIS 5R/TD RPU two-minute average wind magnitude to the ASOS average wind magnitude: **0.76**
- Average difference between the RWIS 5R/TD RPU two-minute average wind direction and the ASOS average wind direction: **16**
- Average ratio of the RWIS 5R/TD RPU wind gust magnitude to the ASOS wind gust magnitude: **0.82**

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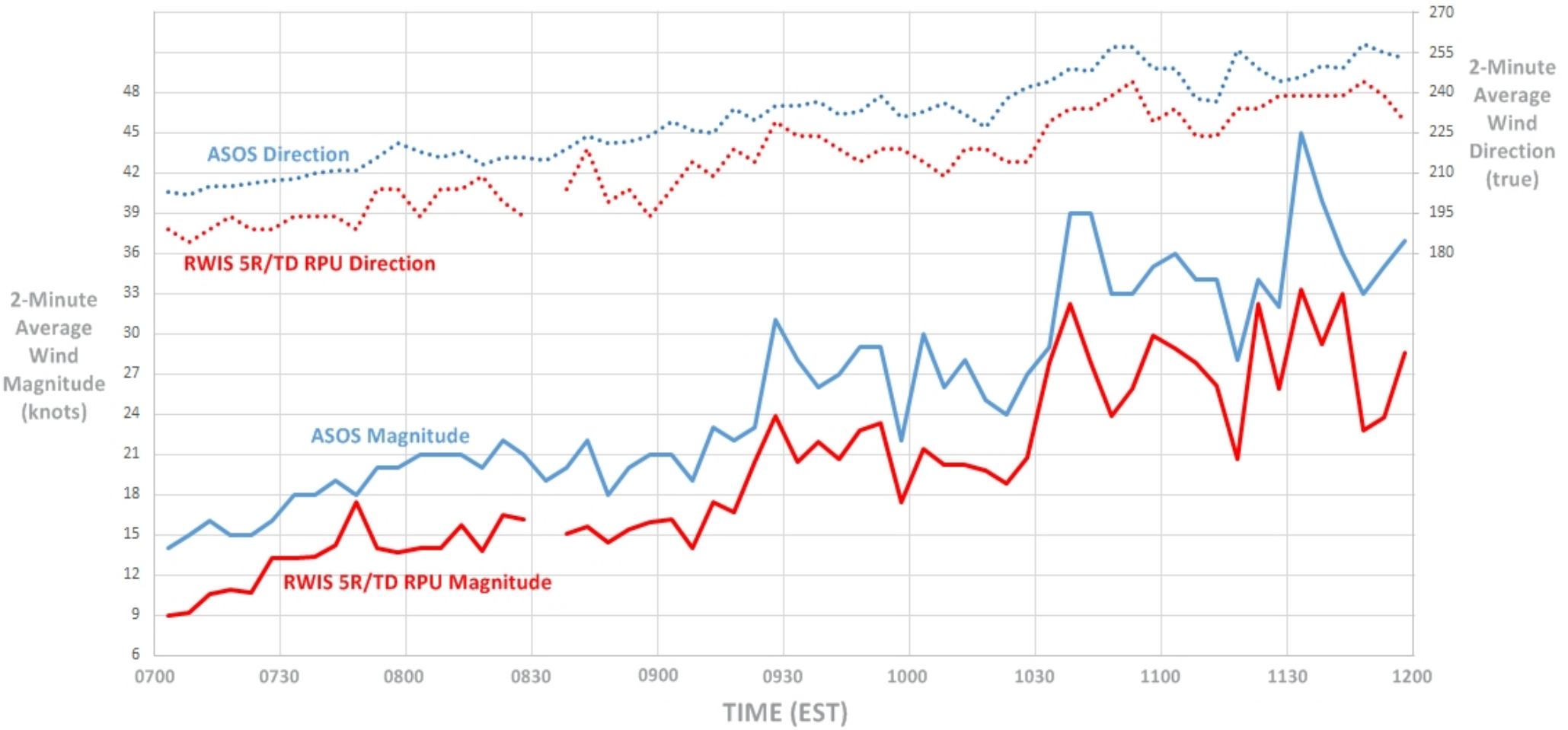


Figure 1 - ASOS Two-Minute Average Wind Magnitude (solid blue line, use scale on left [knots])
 RWIS 5R/TD RPU Two-Minute Average Wind Magnitude (solid red line, use scale on left [knots])
 ASOS Two-Minute Average Wind Direction (dotted blue line, use scale on right [degrees true])
 RWIS 5R/TD RPU Two-Minute Average Wind Direction (dotted red line, use scale on right [degrees true])

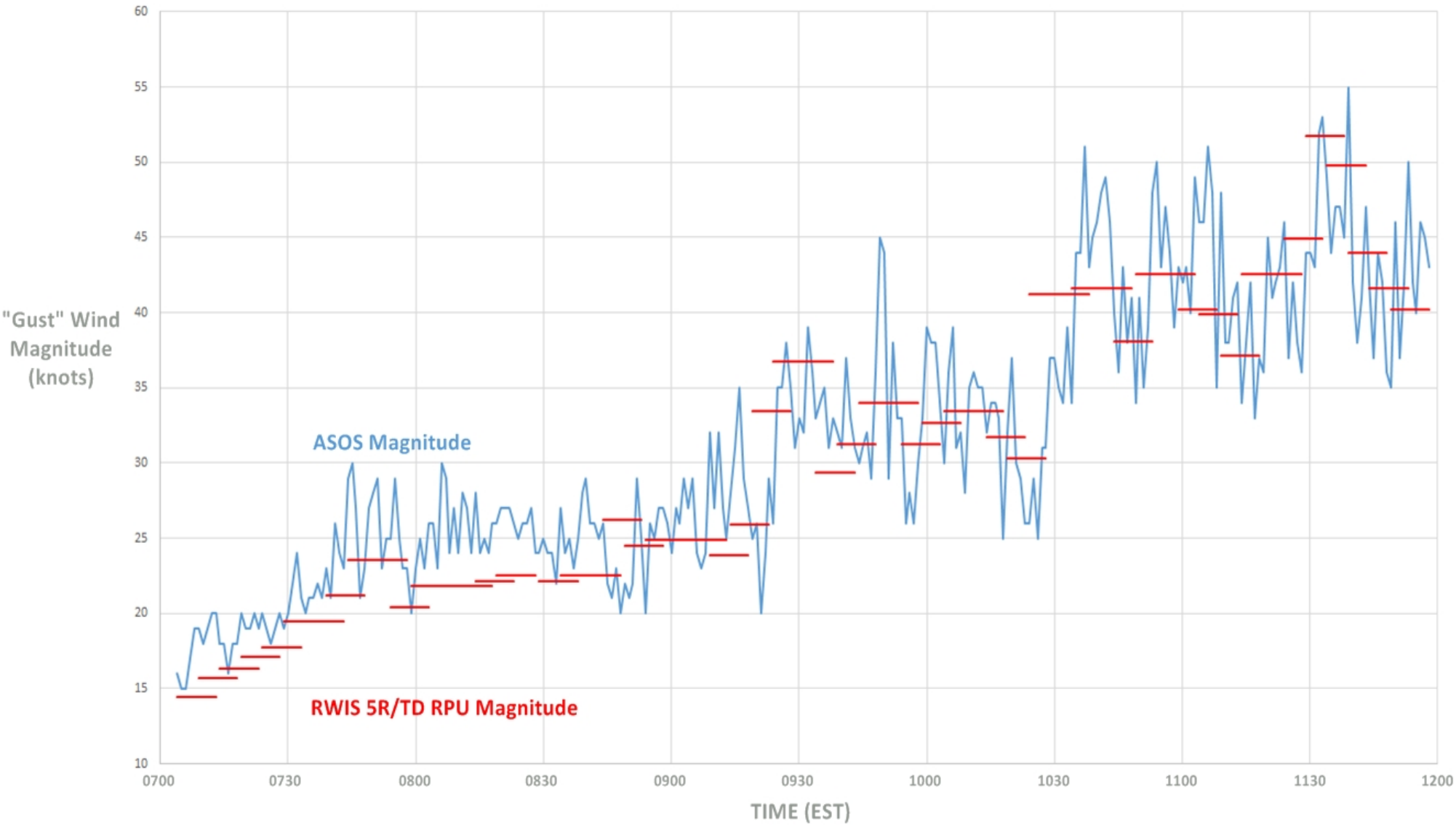


Figure 2 - ASOS Wind Gust Magnitude (solid blue line [knots])
RWIS 5R/TD RPU Wind Gust Magnitude (solid red lines [knots])

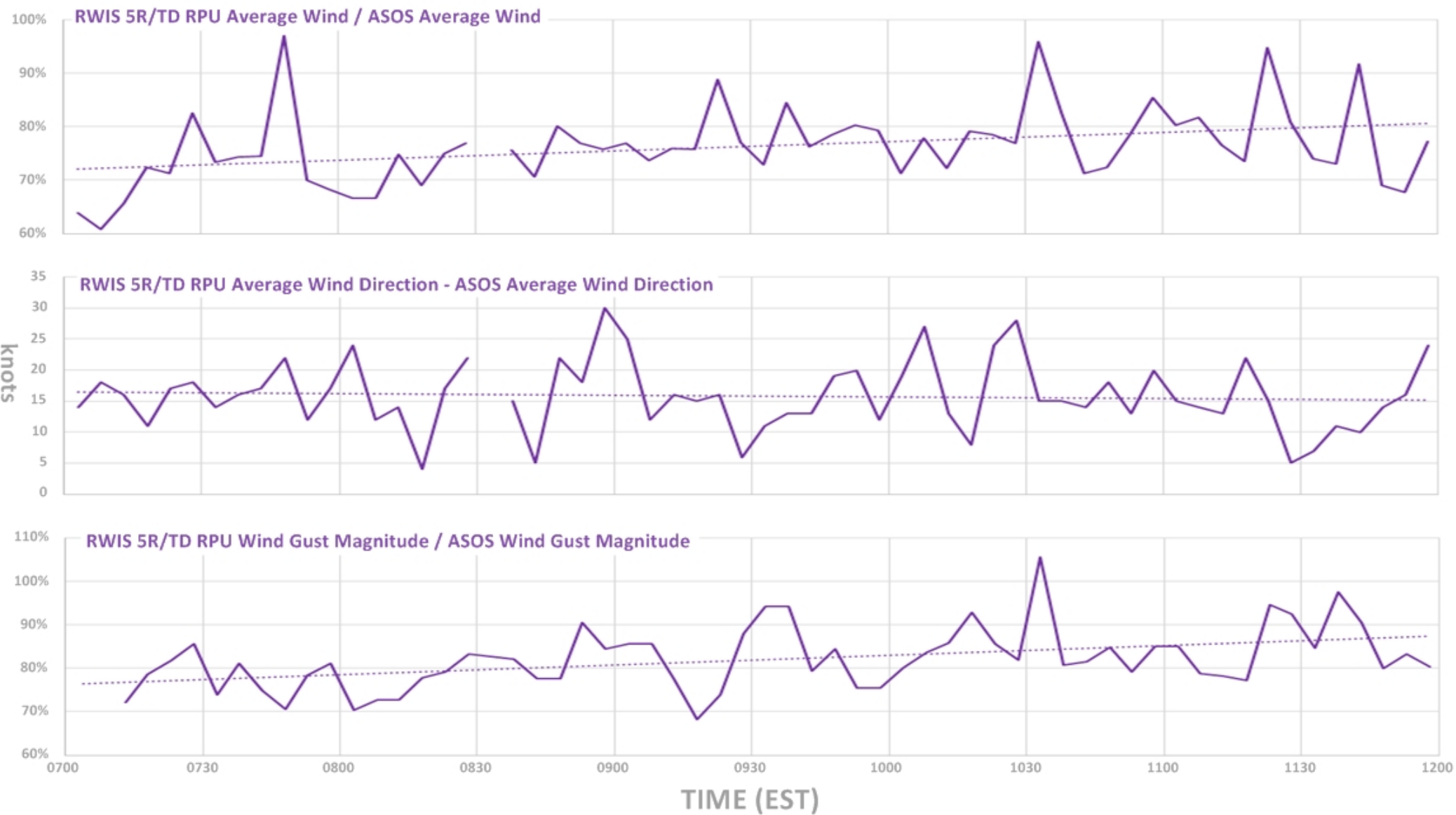


Figure 3 - RWIS 5R/TD RPU Average Wind Magnitude / ASOS Average Wind Magnitude (top panel [percentage])
 RWIS 5R/TD RPU Average Wind Direction – ASOS Average Wind Direction (middle panel [knots])
 RWIS 5R/TD RPU Wind Gust Magnitude / ASOS Wind Gust Magnitude (bottom panel [percentage])