

Summary

The relationship between instrumental polarization (IP) model parameters and skydip azimuth (AZ) is investigated. There is no evidence of the dependence of the IP parameters on AZ.

Fourteen skydips were taken at different azimuth angles during the 2015 commissioning run. Table 1 shows the number of skydips at each azimuth angle. The Q and U signals are fairly regular across the skydips, regardless of the AZ angle (the WVM τ values range between 0.033 - 0.065). Figure 1 shows the Q, U, θ_{IP} and PI signals for three different AZ angles.

AZ (deg)	Num of Skydips
30	1
40	1
120	9
160	1
270	2

Table 1 The number of skydips taken at each AZ.

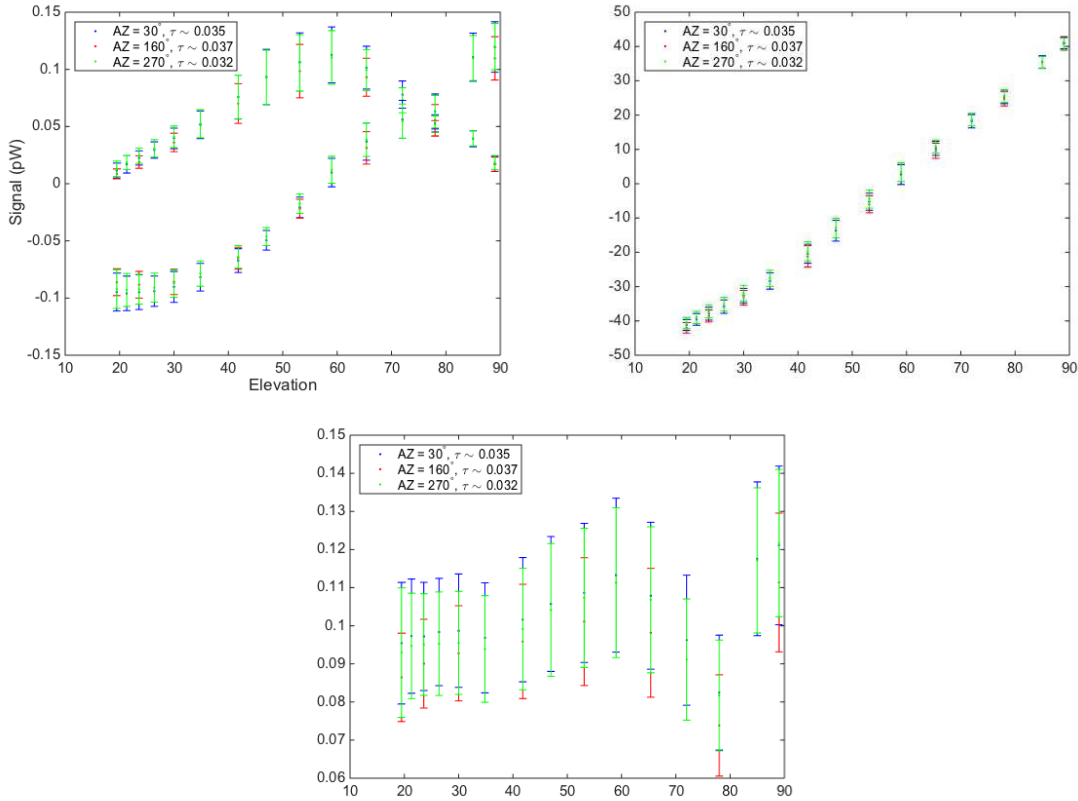


Figure 1 The skydip signals for three difference AZ angles. The error bars are the standard deviation across the focal plane and the X-axis is the elevation (in degrees). **Top Left:** The Q and U signals. **Top Right:** The IP angle (in degrees). **Bottom:** The polarization intensity (in pW).

For a more detailed investigation, the IP parameters for each channel are measured for each skydip and grouped into common AZ values. The results at $AZ \neq 120^\circ$ are compared to the distribution of the IP parameters at $AZ=120^\circ$ (The standard deviation at $AZ=120^\circ$ excludes 1 data point to prevent extreme outliers from affecting the measurement). A [Kolmogorov-Smirnov](#) (KS) test is used to determine if the data at $AZ \neq 120^\circ$ are consistent with the distribution at $AZ = 120^\circ$. Across the focal plane, there is general consistency between the two datasets. Focusing on the P_s parameter, figure 2 shows the distribution plots of a few individual channels and figure 3 shows the results of the KS test across the focal plane. The C_o parameter shows similar results. The Q and U offsets will be investigated soon.

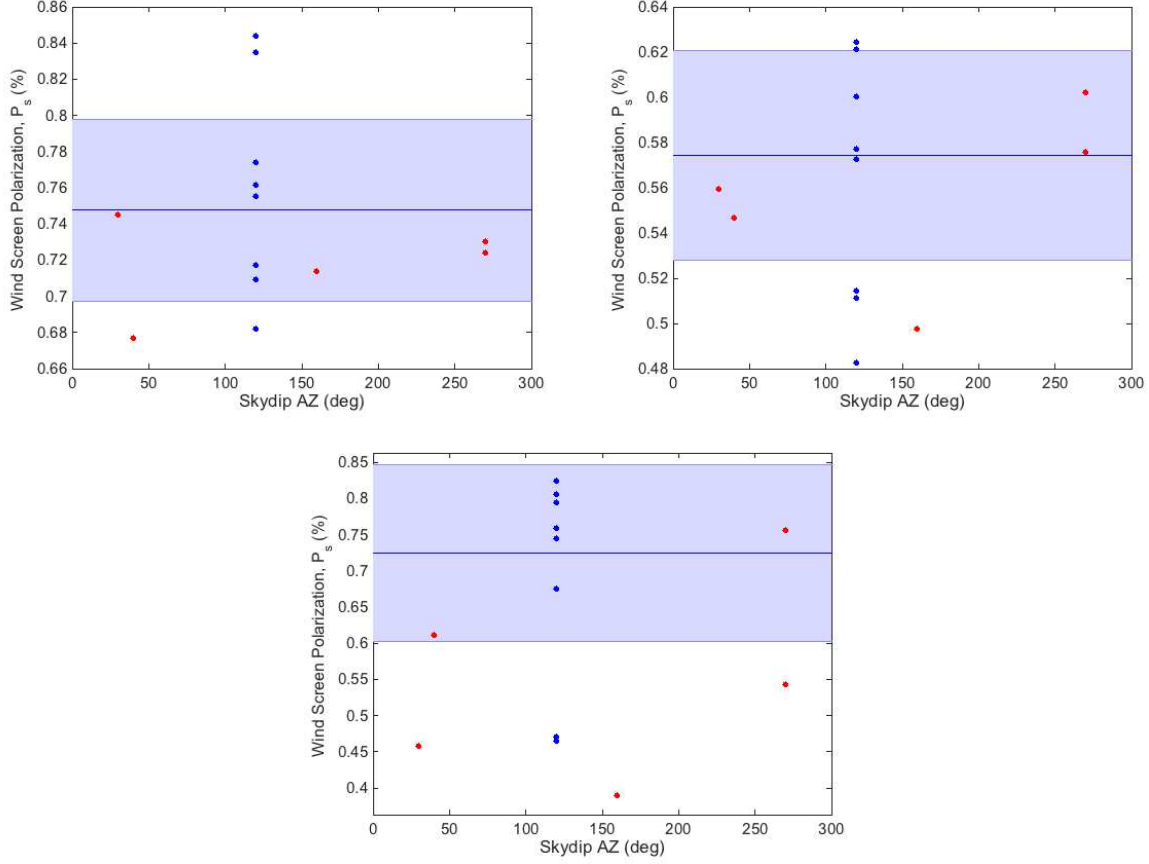


Figure 2 The windscreen polarization percentage (P_s) for three respective channels. The blue bar indicates the mean and standard deviation of the data taken at $AZ=120^\circ$. The data for the top two channels are internally consistent (the KS test can't reject the null hypothesis), the bottom channel appears inconsistent (the KS test rejects the null hypothesis).

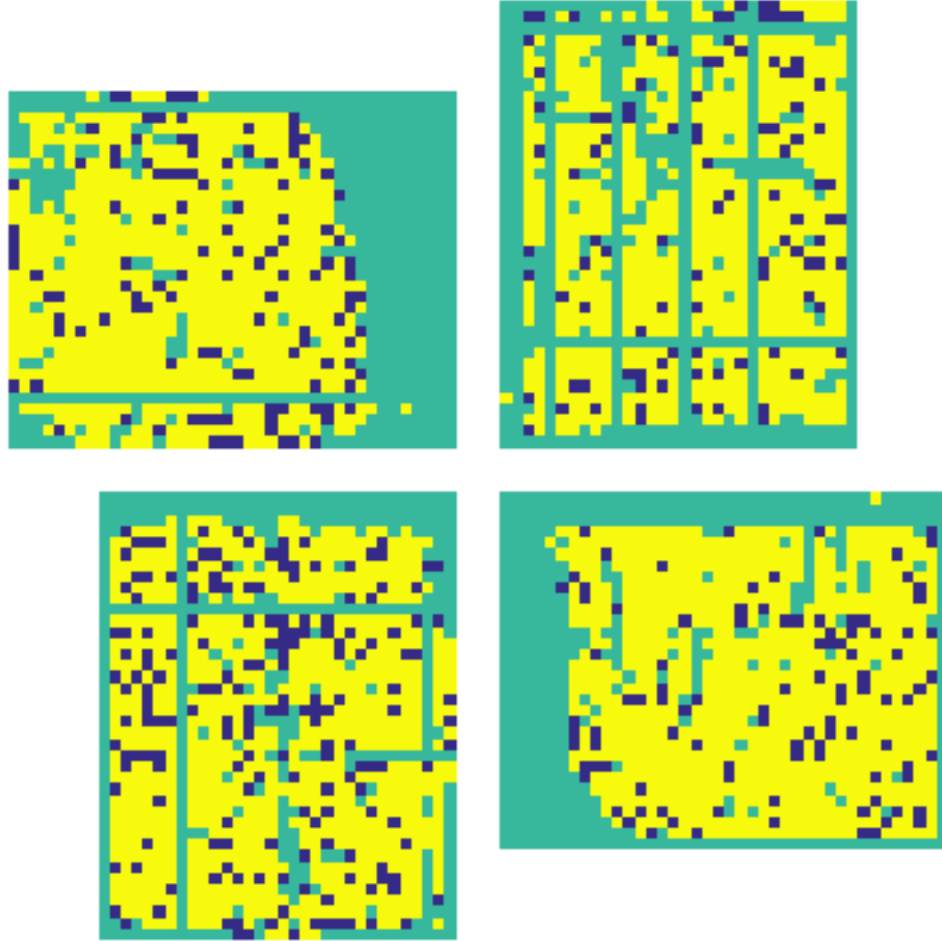


Figure 3 Top: The results of the individual channel KS tests. Channels marked yellow have data that is internally consistent (the $AZ \neq 120^\circ$ are consistent with the $AZ = 120^\circ$ data). The channels in blue are inconsistent. There is no data for channels marked in green.