In our lab on differential GPS, we tried to get ‘big excursions’ in our recorded data sets in order to find correlated errors between receivers, and, with this presence of correlation, fix the imprecisions with the help of our very own Differential GPS Ground-station. We had hoped to find correlated errors at two separate sites in order that one site might serve as the fixed ground-station that could help correct the other, ‘nearby’ station’s readings. Even though the two receivers did lock on the same nine satellites for a time, the errors for altitude were still not correlated and the two receivers could not help each other correct their altitude-based coordinates. If we look at the standard deviations and the correlation coefficients for altitude, we can easily see these uncorrelated and, thus, unsuccessful results.

ALL SATELLITES:
- Standard deviation (G\textsubscript{U-J} U) = 5.26
- Correlation coefficient = 0.24
- Ratio of st. deviations = 0.936033679
- Square root of sum = 5.621428107

NINE SATELLITES:
- Standard deviation (G\textsubscript{U-J} U) = 6.584053252
- Correlation coefficient = 0.25017653
- Ratio of st. deviations = 0.942781352
- Square root of sum = 6.983648154

SAME NINE SATELLITES:
- Standard deviation (G\textsubscript{U-J} U) = 2.289243307
- Correlation coefficient = 0.082423308
- Ratio of st. deviations = 0.962420686
- Square root of sum = 2.378630614
We see here that the standard deviation of the differences between the two data sets decreases from all satellite readings to readings from nine satellites to readings from the same nine – the general “error” from the mean altitude position decreases. But, the correlation coefficient (how spread out or close together the errors are) actually gets much closer to zero at the same time, meaning that the errors go from being somewhat uncorrelated with all satellites to being incredibly uncorrelated with the same nine. The ratio or standard deviations also shows that, because it is closer to 1 with nine satellites in lock (rather than with all satellites), there is, again, very little correlation between errors. As discussed above, differential GPS only functions when errors are correlated, and, as the calculations prove, the errors in altitude were really not correlated at all – differential GPS would not have helped correct the altitude inaccuracies that resulted from the obstructing screen.