**Conclusion**

As now observed, a Fourier series can be used to approximate a complex set of data points. While it is only an approximation as accurate as the number of terms included, it allows for many useful applications. The density measurements of the rocket data from 850 seconds to 900 seconds contains a significant amount of noise and interference. The Fourier series provides a method for filtering the data in order to obtain a smooth curve. The full series, as well as the cosine series will give similar, yet differing results to the data approximation. Neither series will always produce a better approximation, however, it provides an alternate result to the data. Furthermore, increasing the number of terms in the series does not equate to a better fitting plot. In fact, too many terms will only begin to reintroduce noise from the experimental data. On the contrary, too few terms will not have adequate information to match the data sufficiently. An optimal number of terms in the middle will yield the best result to each the cosine and full series.

Another remarkable aspect of the Fourier series is its adaptability. This experiment only represents one data set used, however, the concept and algorithm can be applied to any data set. Fourier series are used every day in our lives to process data and information that is too complex to use in its raw form. Having a method to condition unprocessed data into a series function is extremely beneficial. Being able to exploit the technique for many application is an impressive accomplishment.