

Results

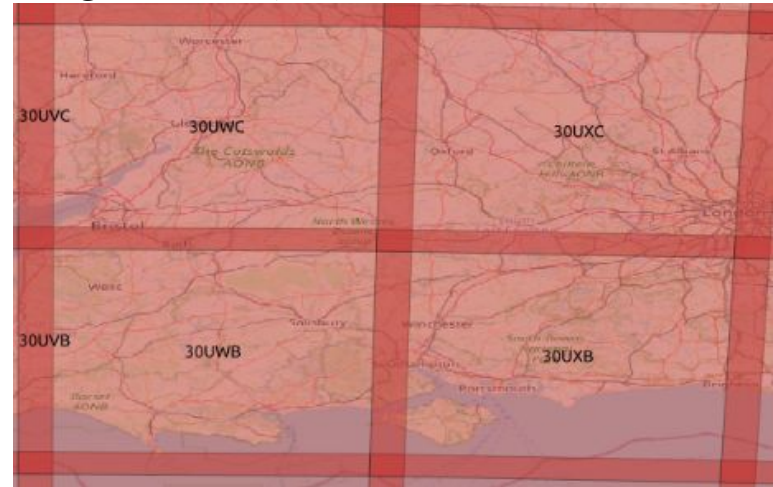
S1, S1 separated ,and S2 band 08

The left subplot refers to the actual value while the right subplot are the errors. The model, pixel and the data considered is mentioned in the title. Please refer to the legend for additional information.

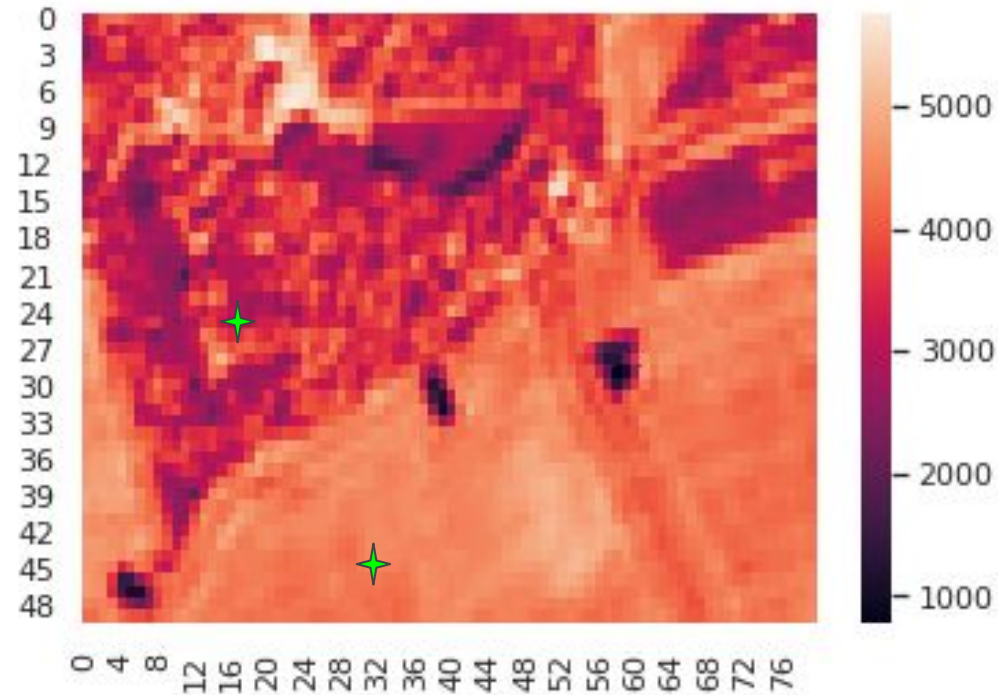
Time, area and, data under consideration

- ❖ Time period between 01.01.2019 - 31.12.2021
- ❖ Area: Top 80x50 area of Surrey, UK Tile 30UXB (As displayed in the figure below)
- ❖ Data used:
 - Sentinel 1
 - Sentinel 1 separated in ascending and descending orbits and,
 - Sentinel 2, Band 08
- ❖ Area under focus (i.e. plotted for every time step)
 - 45_32
 - 25_16
- ❖ Models compared:
 - Prophet
 - AutoARIMA

Note: Variations in data and time period in individual cases are mentioned separately



Area under focus (marked with crosses✦)

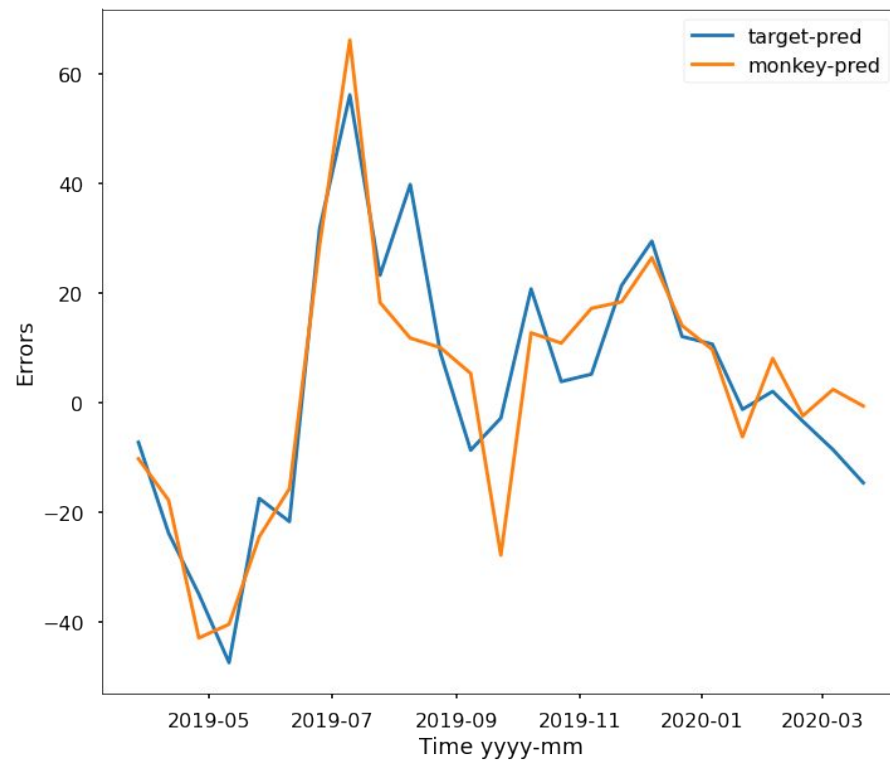
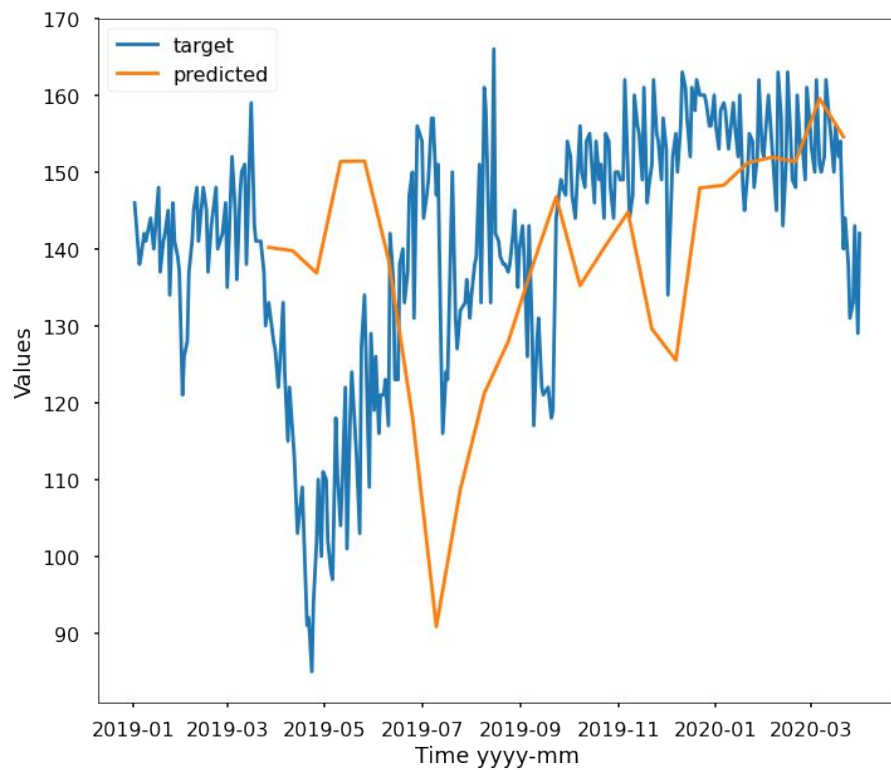


Pixel 45x32

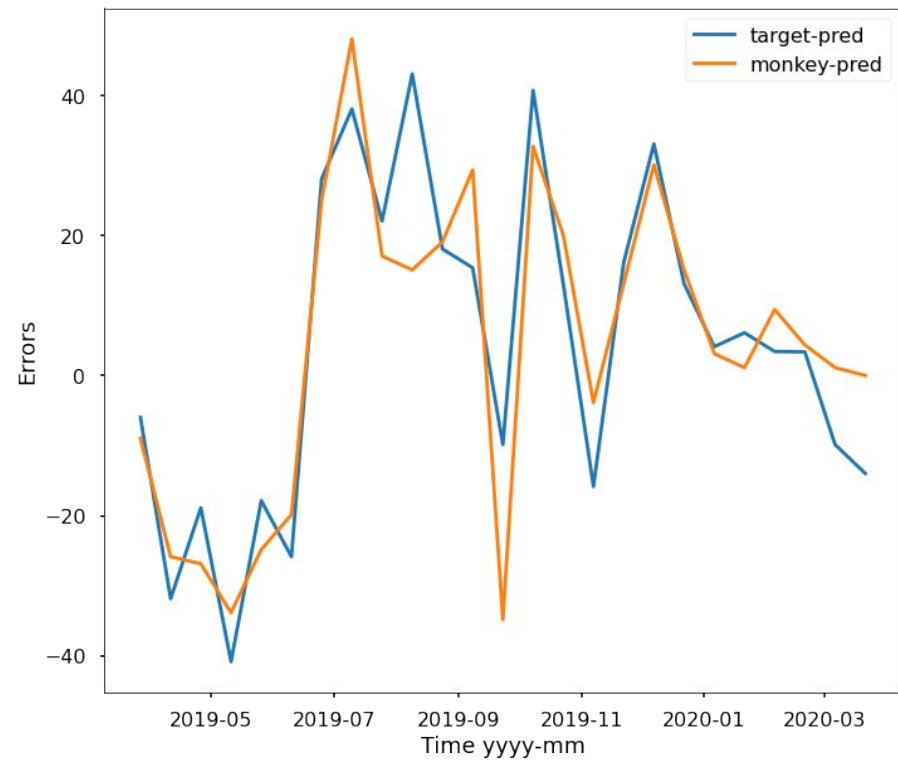
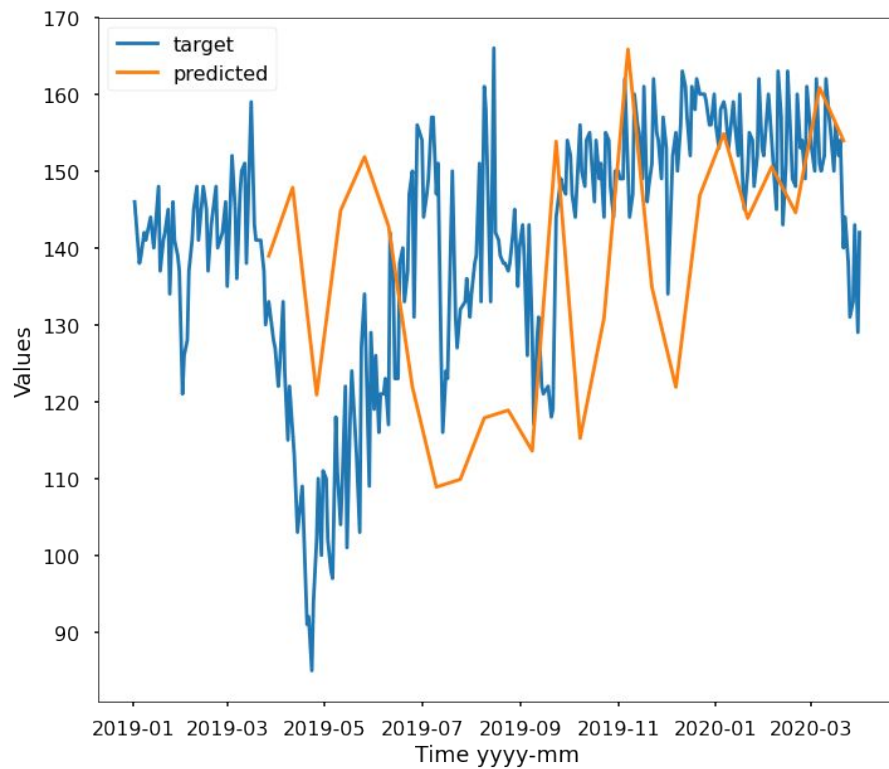


Results: S1





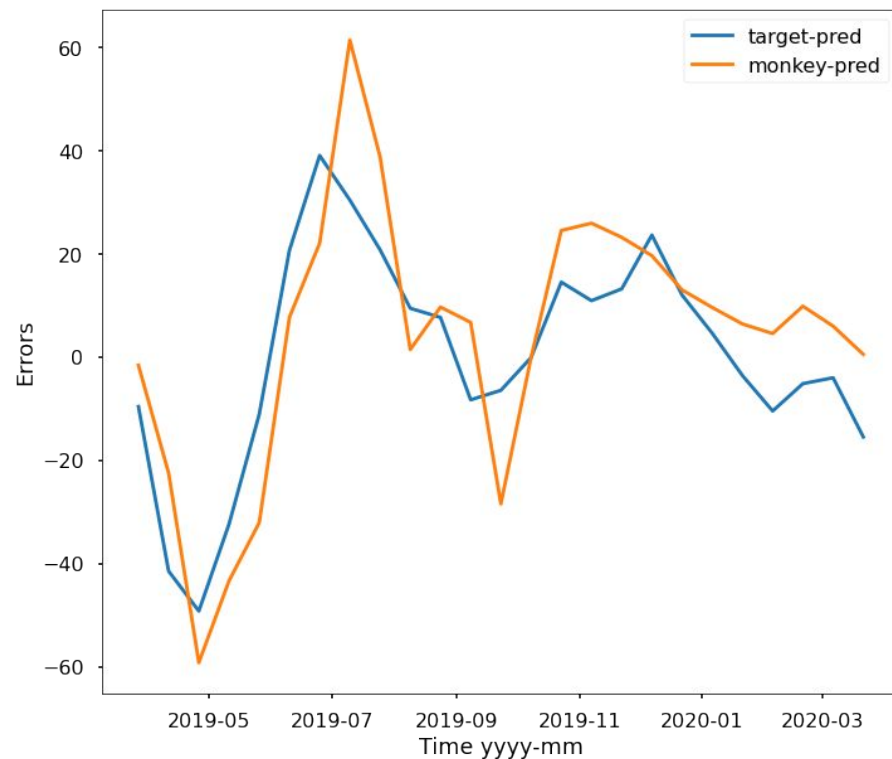
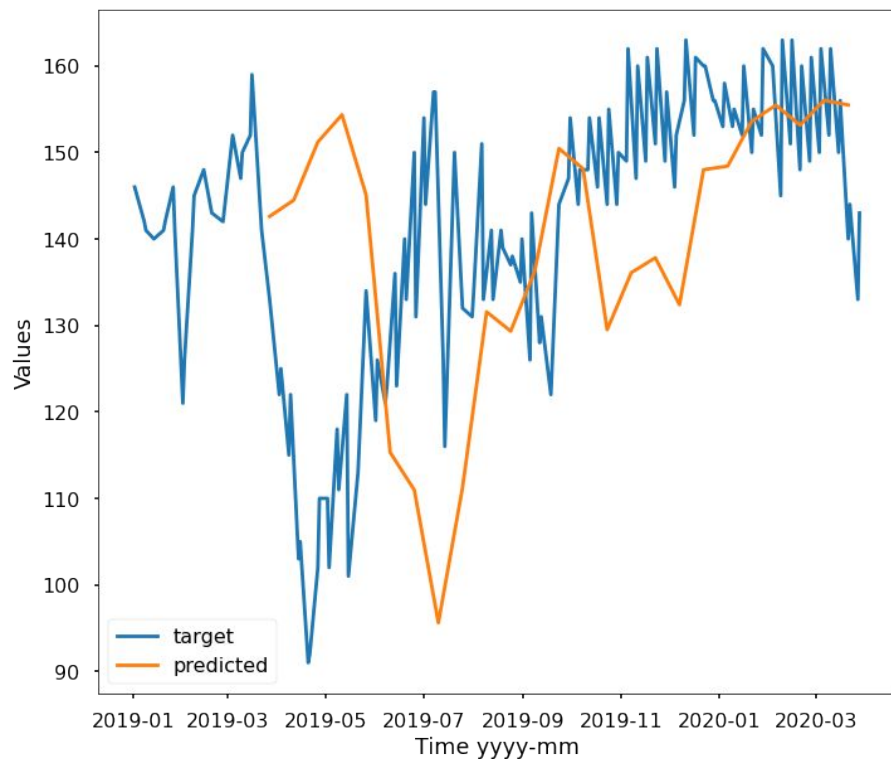
S1 45x32 - Prophet

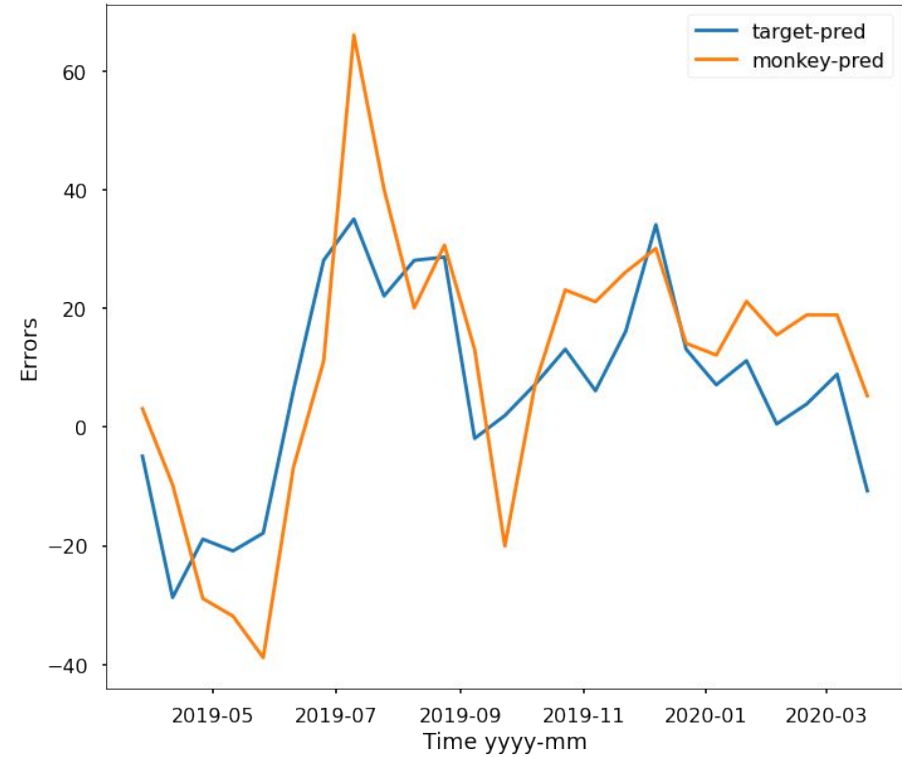
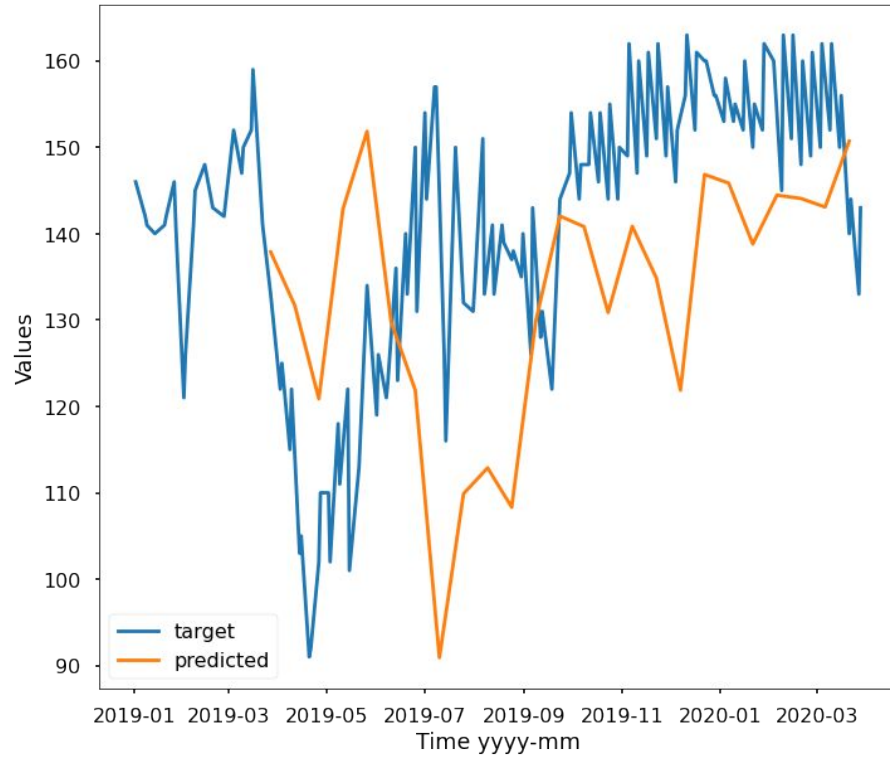


S1 45x32 - AutoARIMA

Results: S1 Ascending Orbit

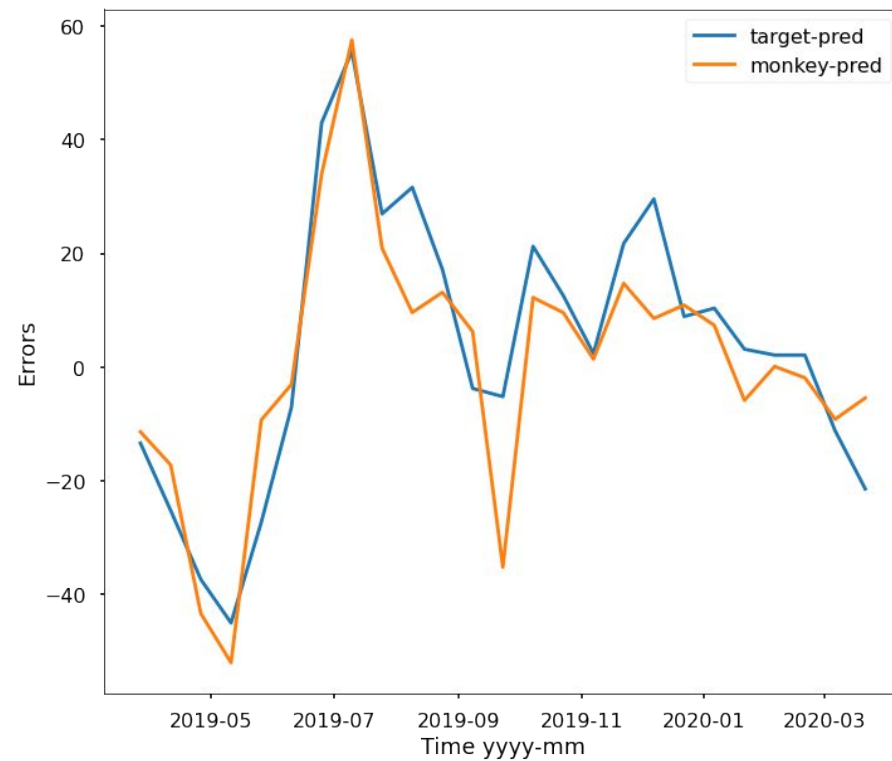
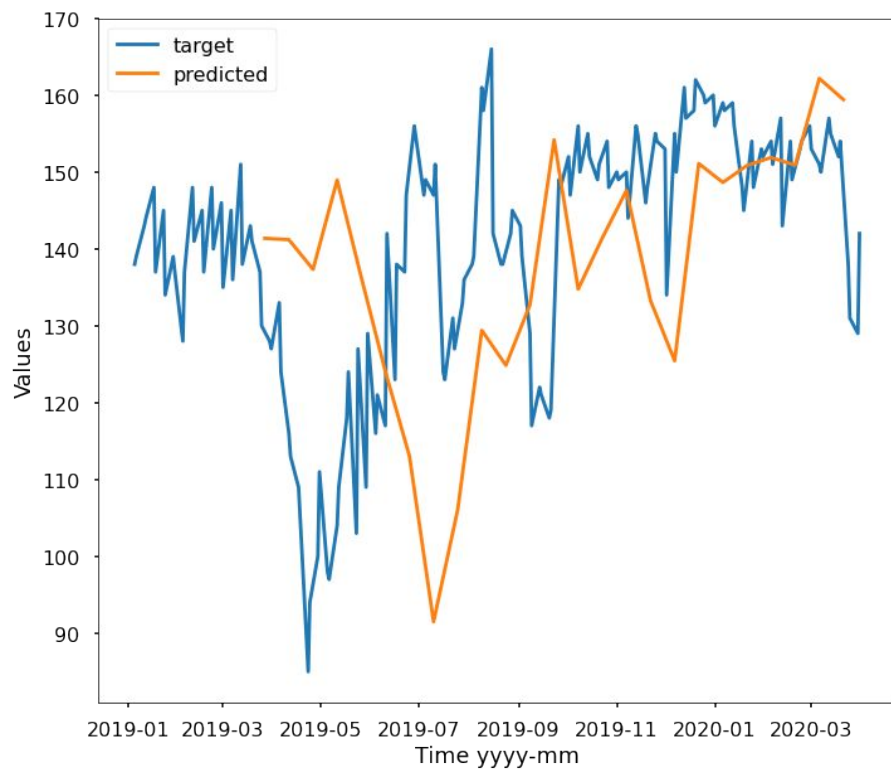


**S1 Asc 45x32 - Prophet**

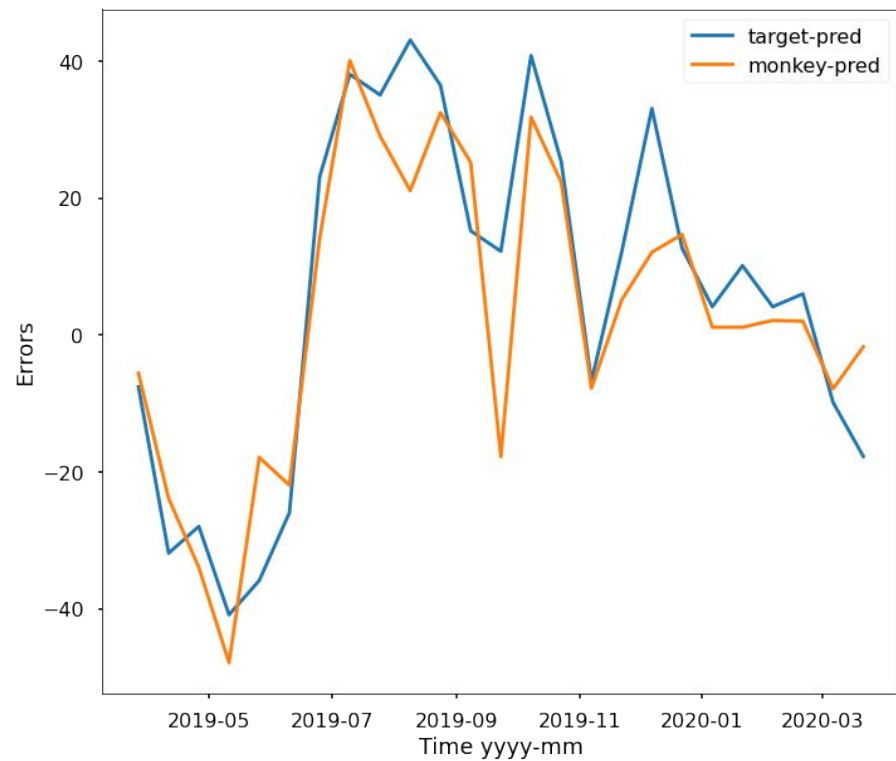
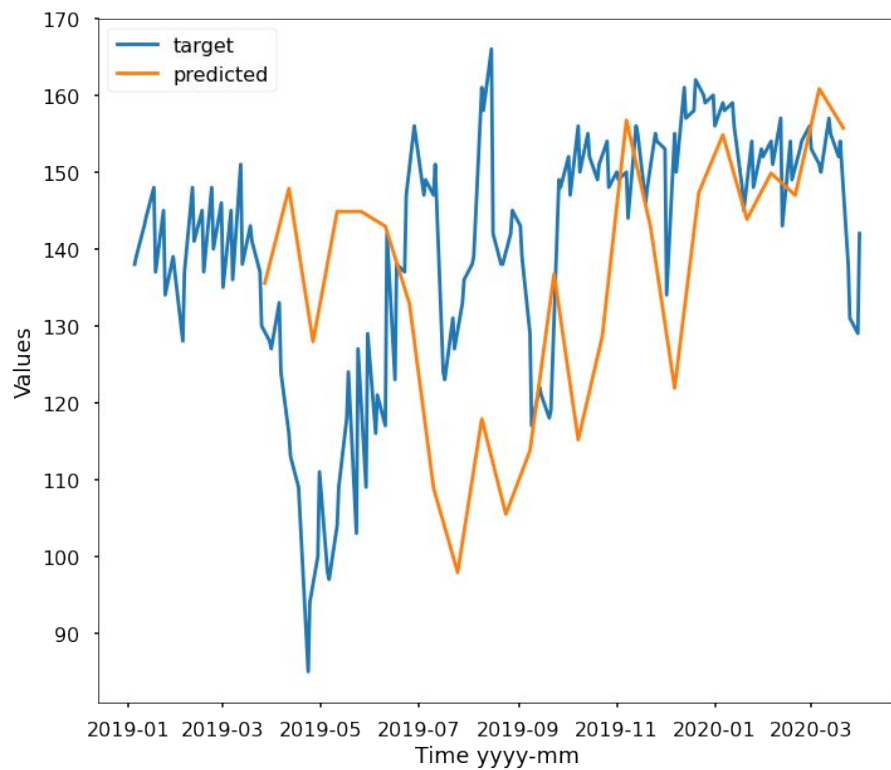
**S1 Asc 45x32 - AutoARIMA**

Results: S1 Descending Orbit





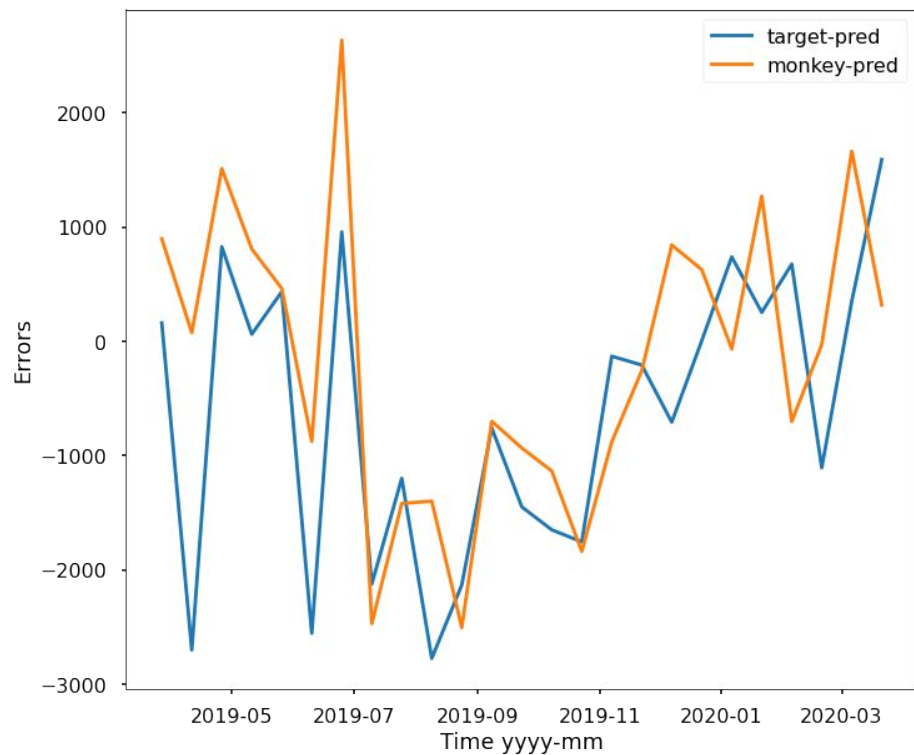
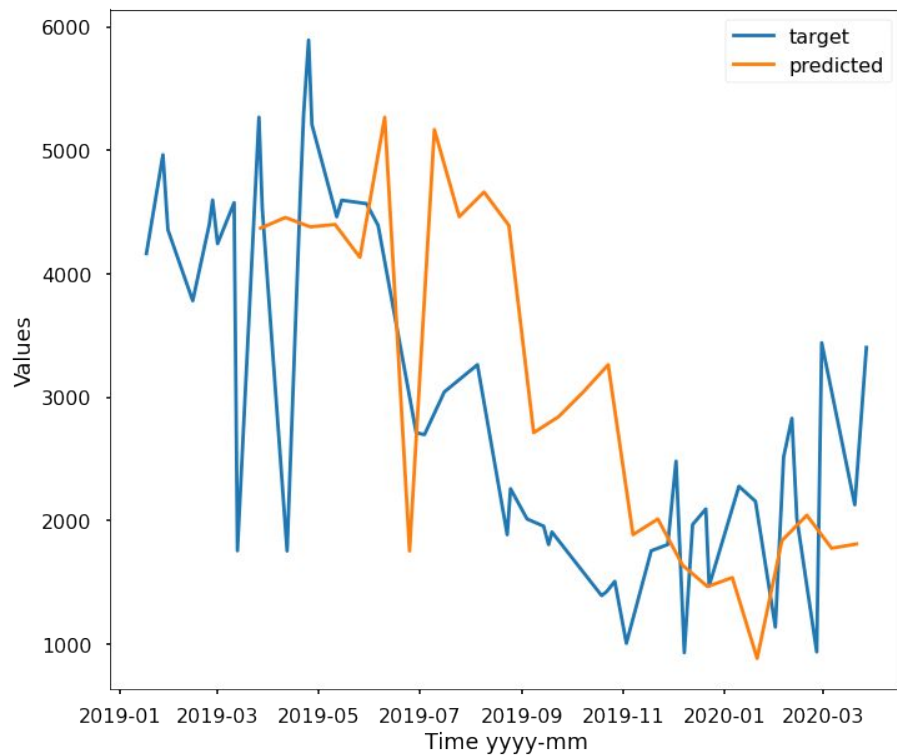
S1 Dsc 45x32 - Prophet

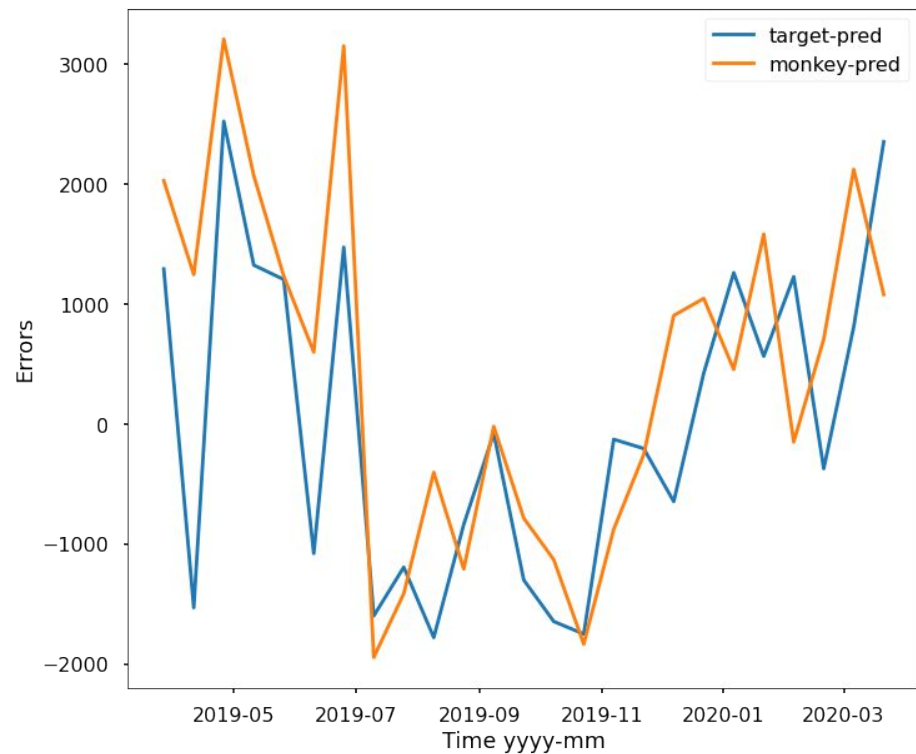
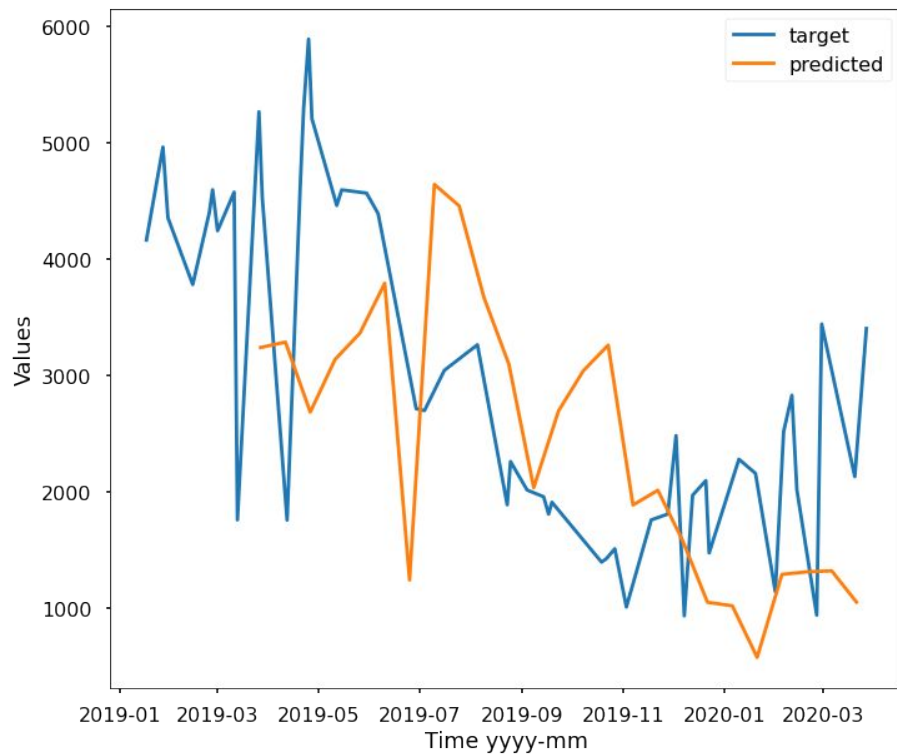


S1 Dsc 45x32 - AutoARIMA

Results: S2 Band 08



**S2B08 45x32 - Prophet**



S2B08 45x32 - AutoARIMA

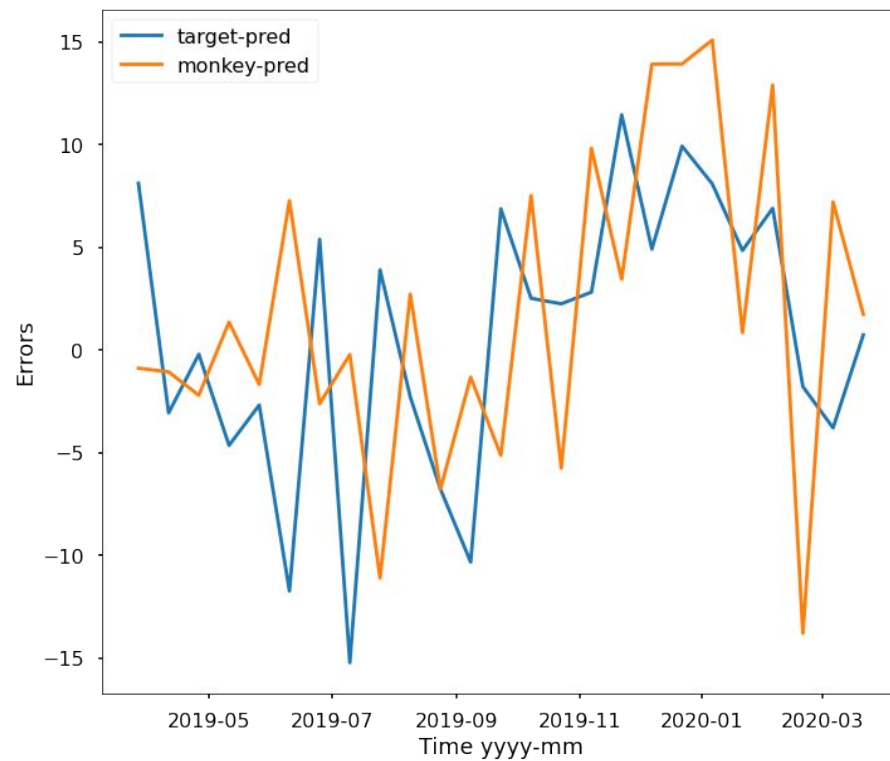
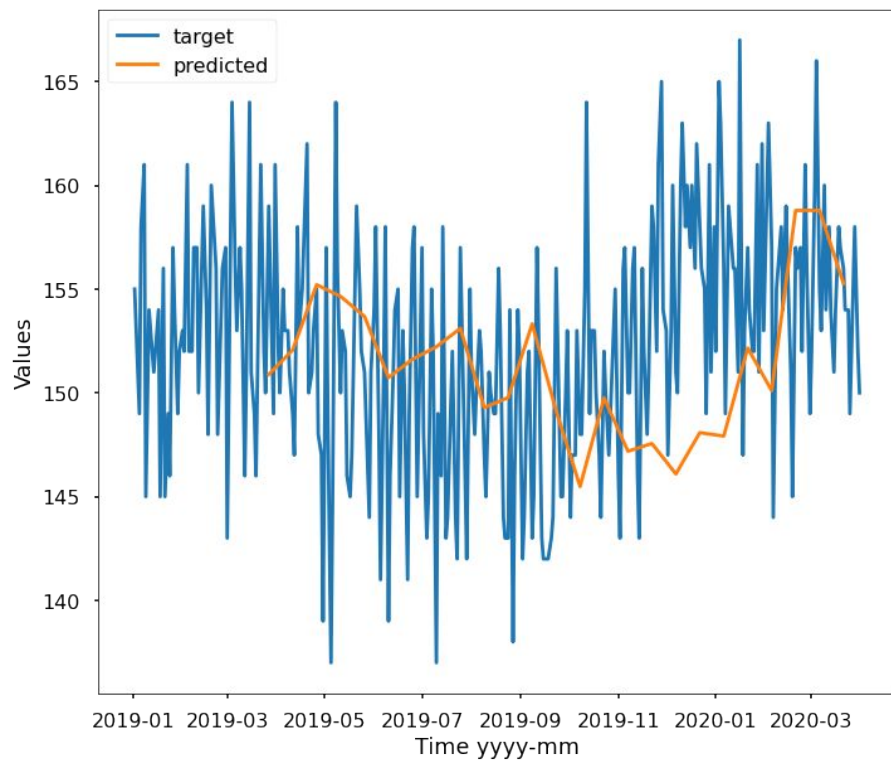
Pixel 25x16



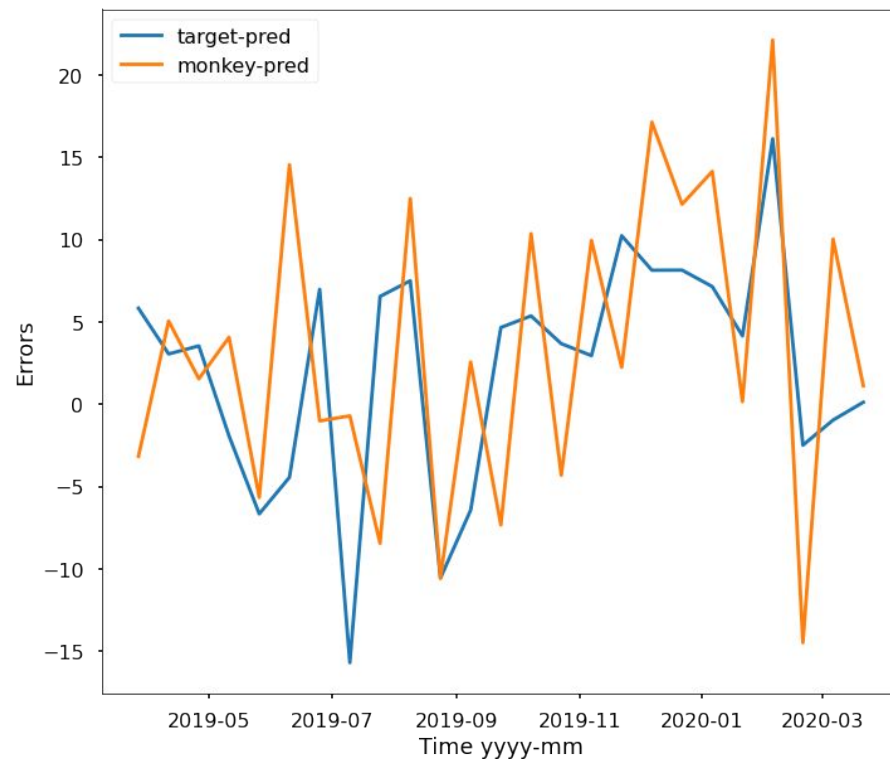
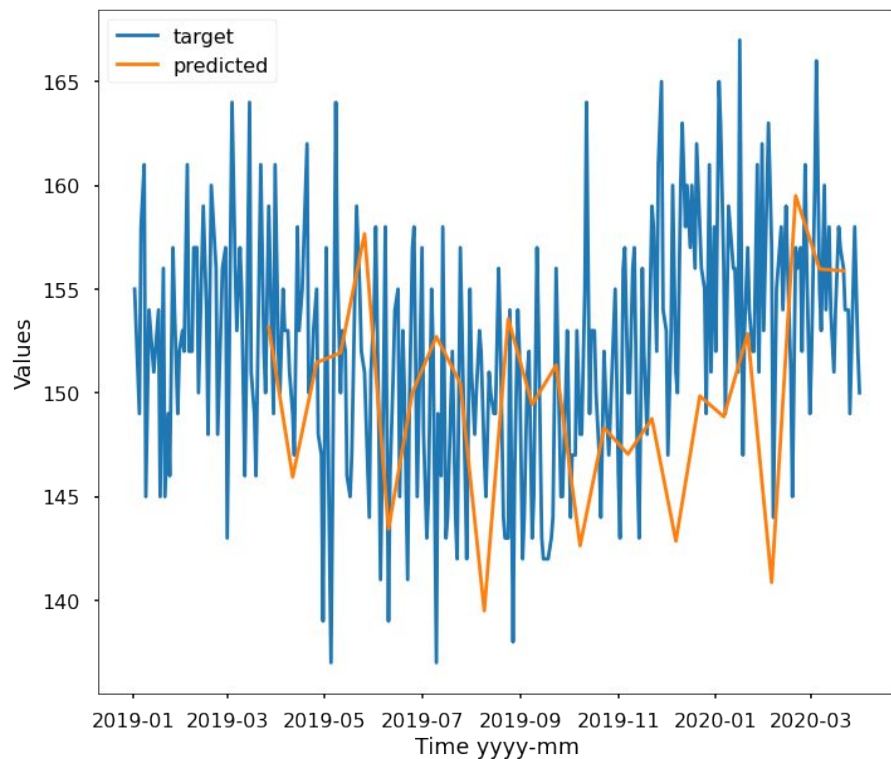
Results: S1



S1 Prophet - 25x16

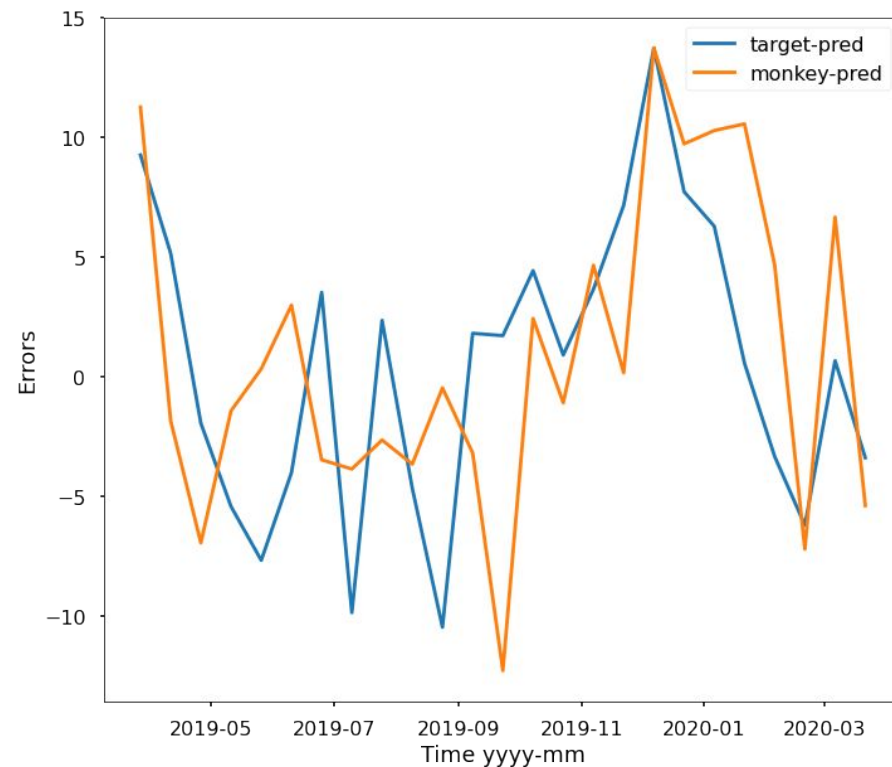
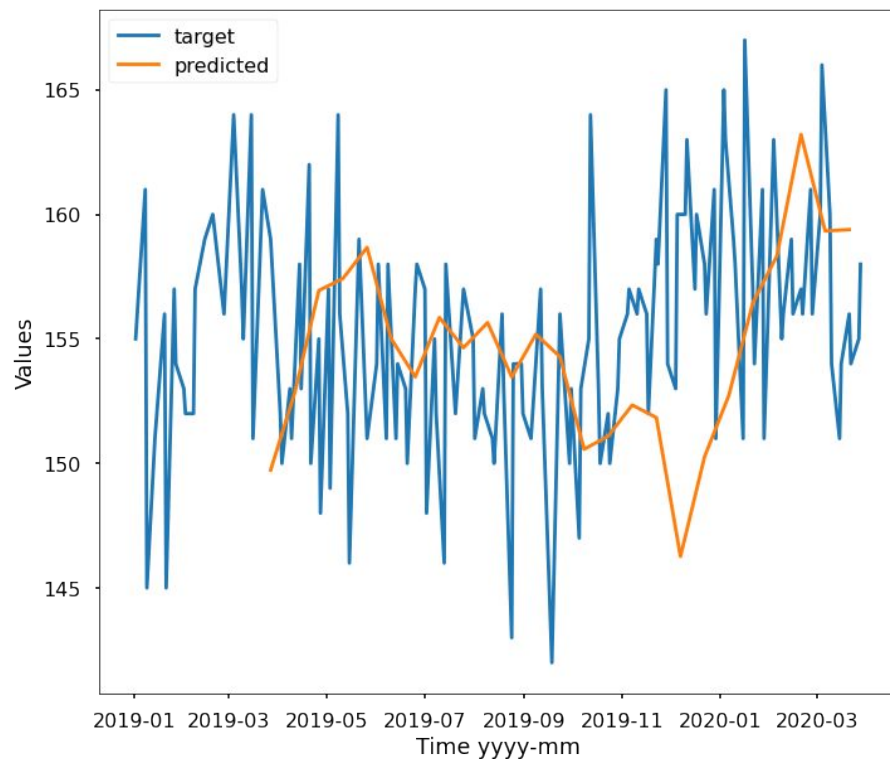


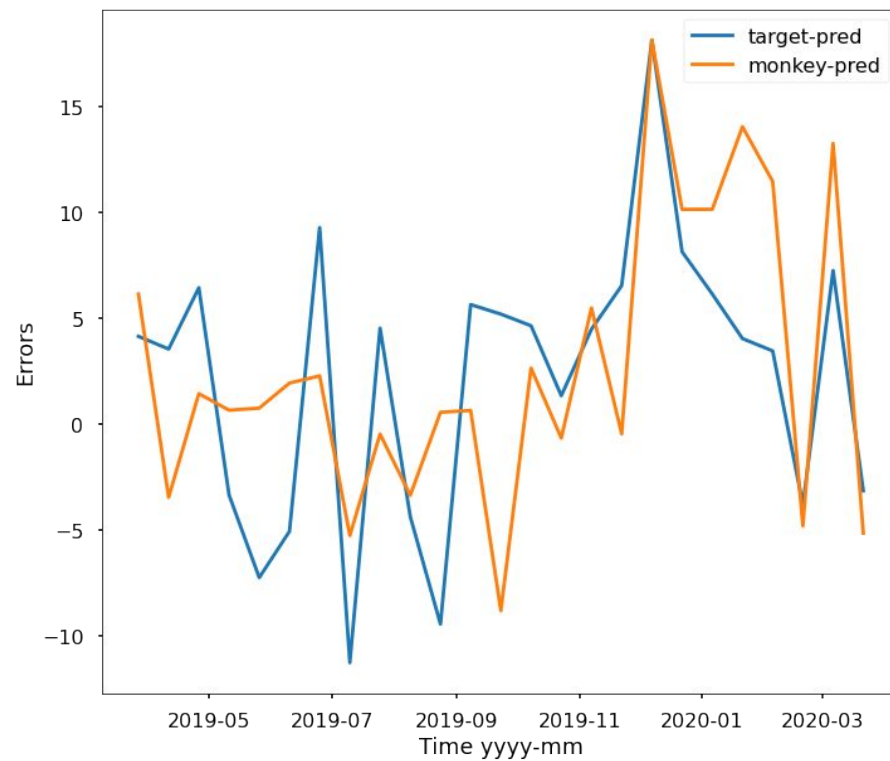
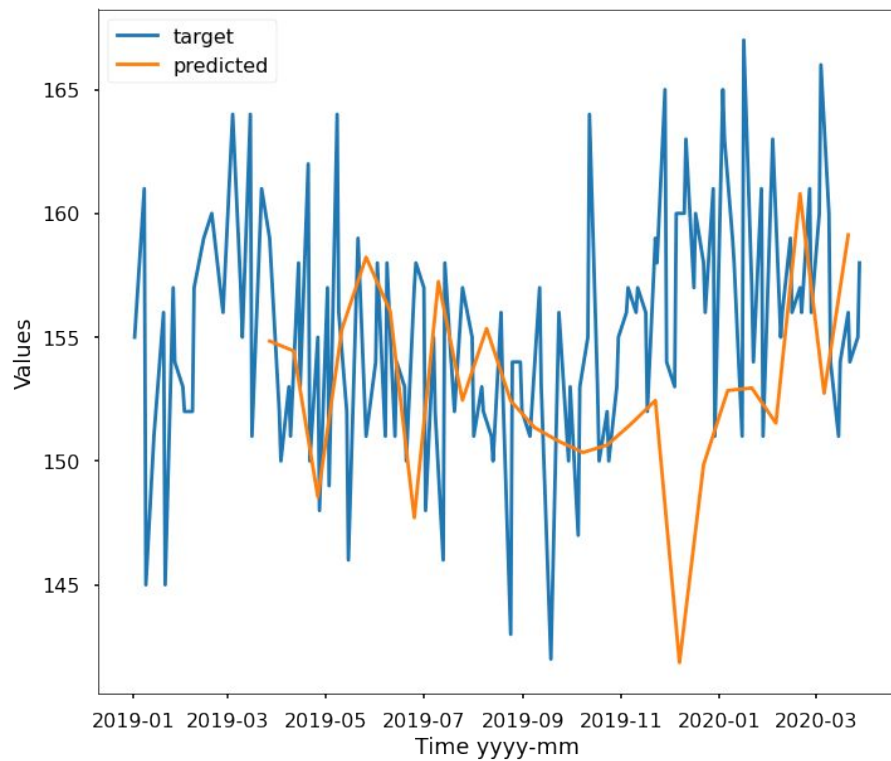
S1 25x16 - Prophet

**S1 25x16 - AutoARIMA**

Results: S1 Ascending Orbit



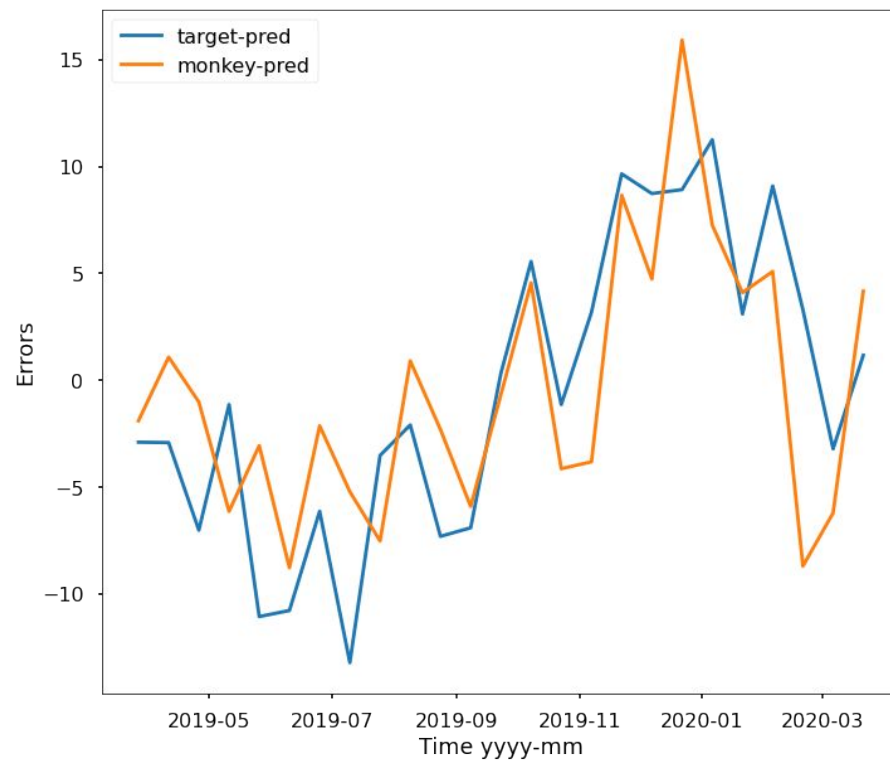
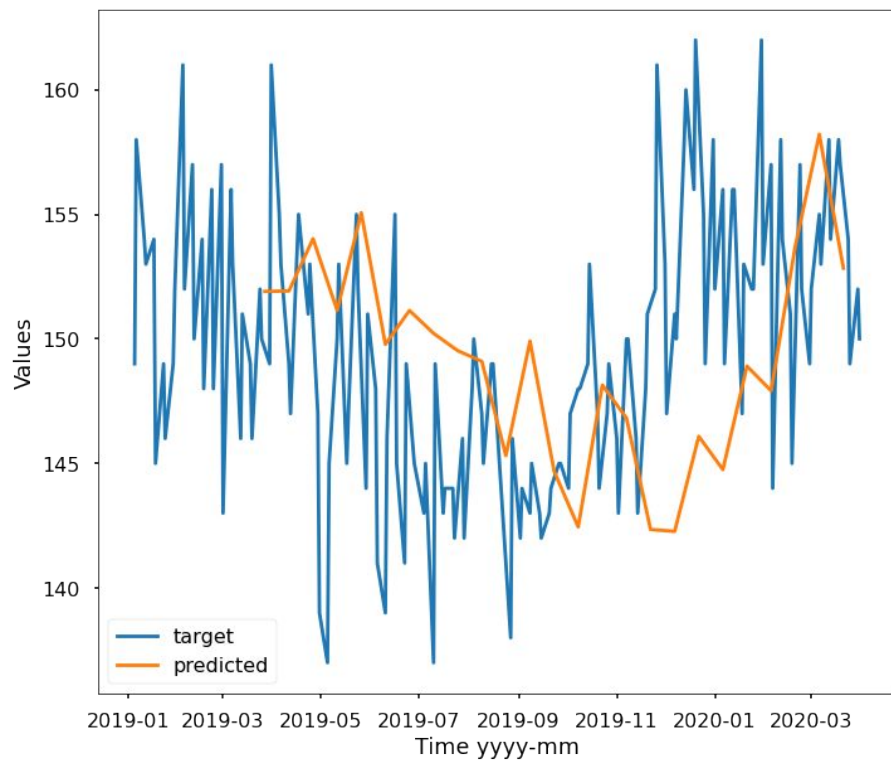
**S1 Asc 25x16 - Prophet**

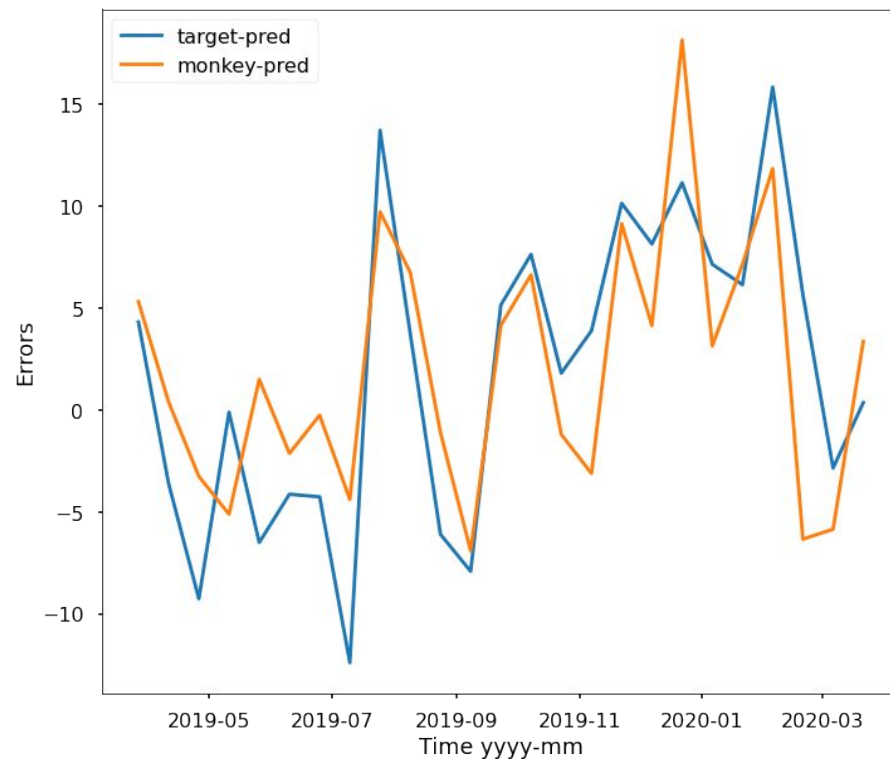
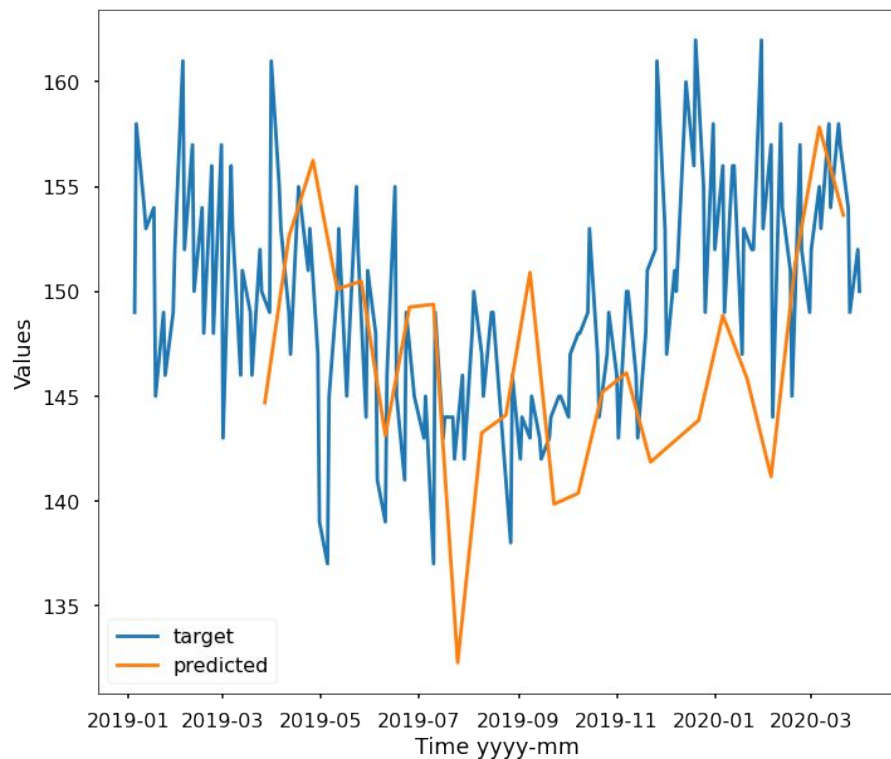


S1 Asc 25x16 - AutoARIMA

Results: S1 Descending Orbit

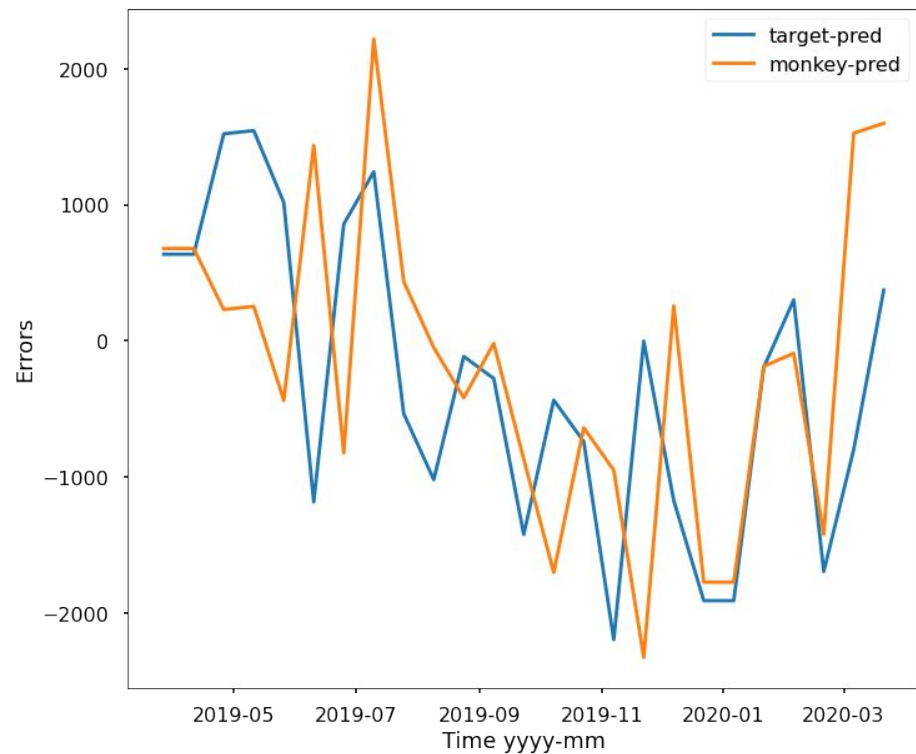
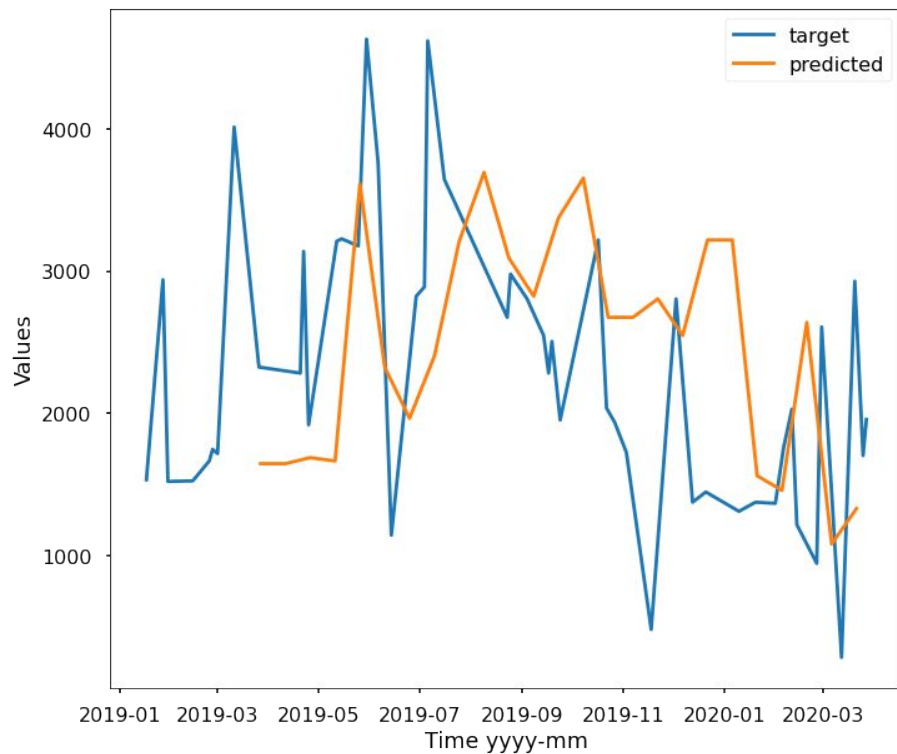


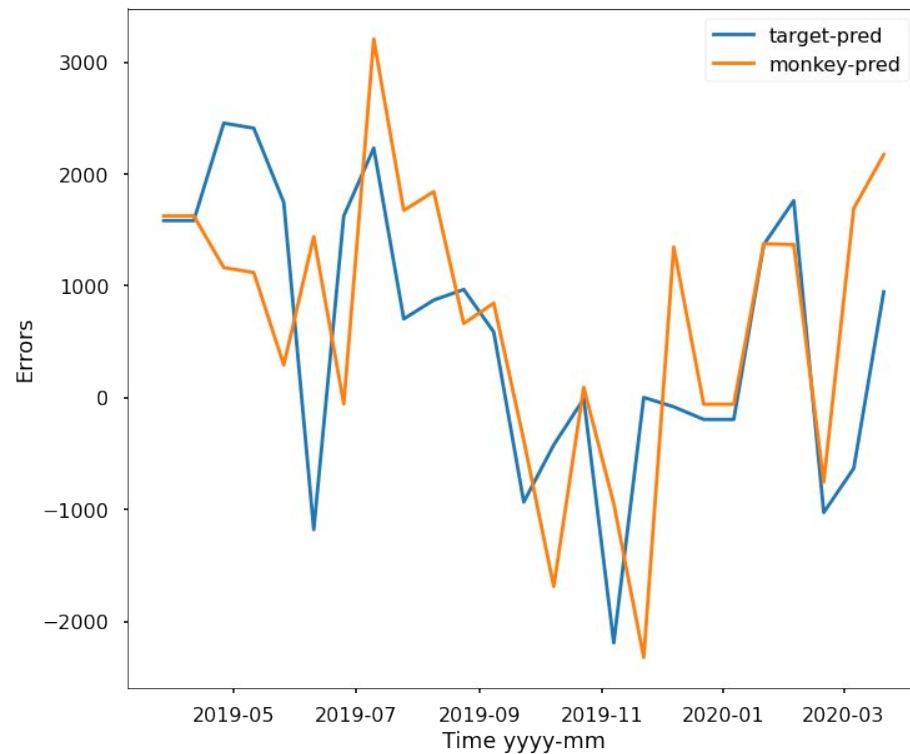
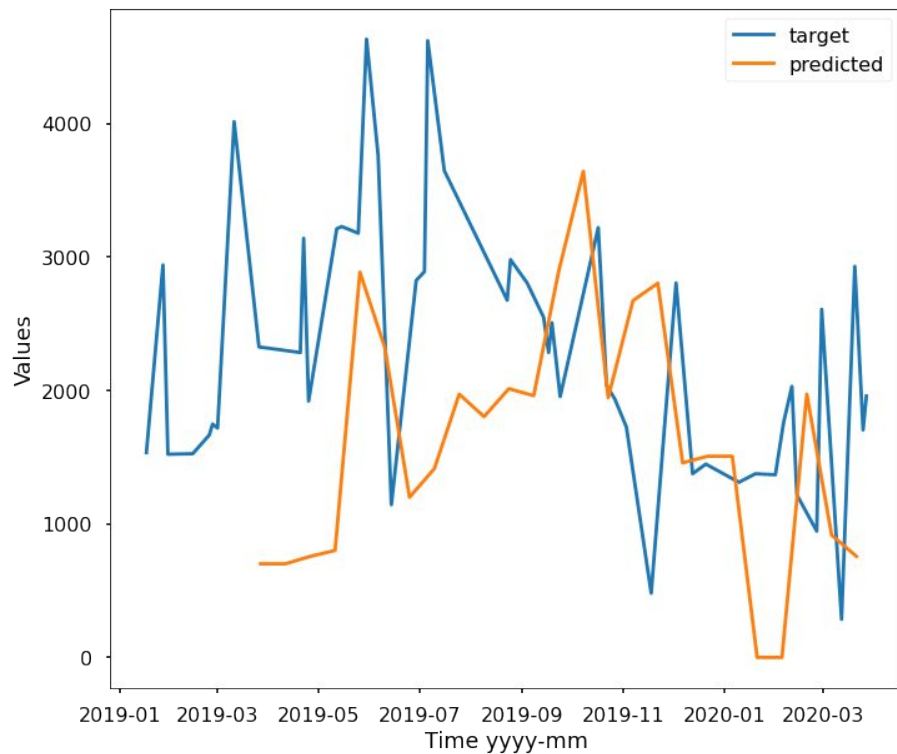
**S1 Dsc 25x16 - Prophet**

**S1 Dsc 25x16 - AutoARIMA**

Results: S2 Bando8



**S2B08 25x16 - Prophet**



S2B08 25x16 - AutoARIMA

Conclusions

- ❖ AutoARIMA is not only faster, but produces marginally better results
- ❖ Errors have the same range as input data range. This can be dealt in two ways:
 - Use more data as input, currently 85 days is the input data
 - In the case of S1, 85 days is roughly 20 data points, which should be good enough in theory
 - In the case for S2, it implies lesser data points, wherein increasing the length of input might improve results
 - However, the series decomposition using LOESS did not yield significant results when tried on the complete 3 year data (refer to the first presentation)
 - Experiment with other algorithms
 - One can use other data hungry algorithms which are computationally more expensive, however, data seems to be an issue in the preliminary tests
- ❖ Convolution using median in a 3x3 spatial area has been already attempted and it did not improve the results significantly

Thank You