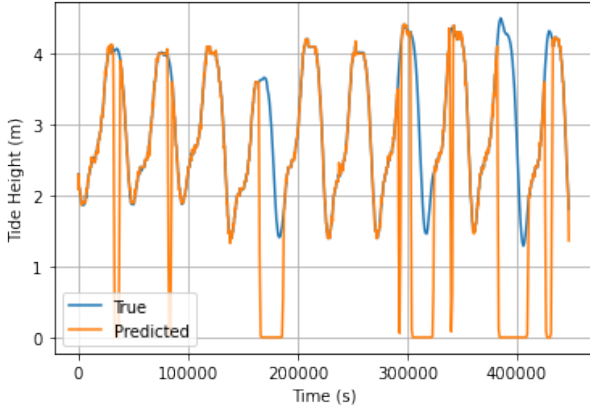


1 Data Pre-processing

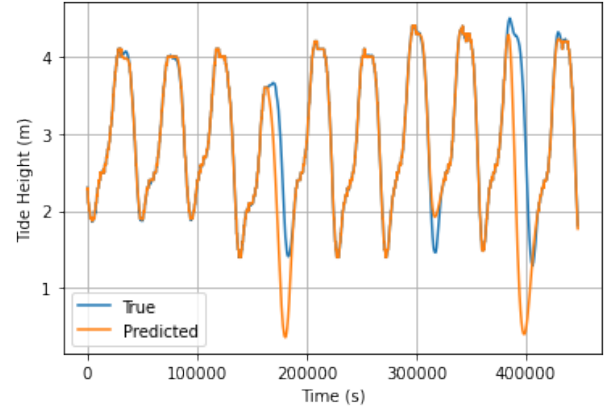
The reading date and time were given in ISO format, so they were converted into seconds with the earliest datetime (2007-05-26T12:05:00) as the zero reference, i.e. the difference between a given datetime and the earliest datetime were calculated in terms of seconds. The 'Time (s)' values in the graphs reflect these calculations.

2 Exponentiated Quadratic

As can be seen below, Figure 1b has noticeably better predictions than Figure 1a. The RMS errors are 0.667 and 1.748 respectively. Including the White Kernel seems to have improved the predictions considerably. That being said, there are quite obvious errors in the predictions in Figure 1b, particularly at roughly 'Time (s)' = 180000 and 400000.



(a) Without White Kernel (RMS error = 1.748)



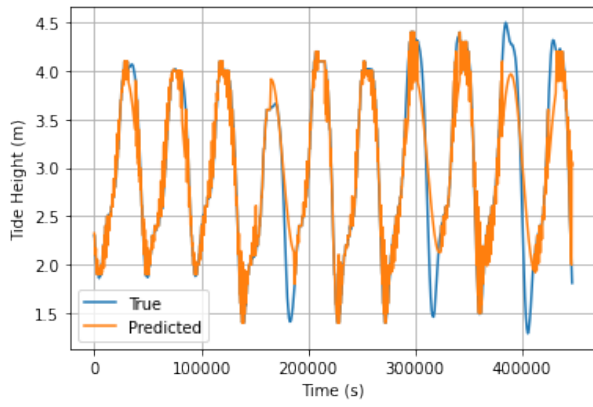
(b) With White Kernel (RMS error = 0.667)

Figure 1: Predicted values

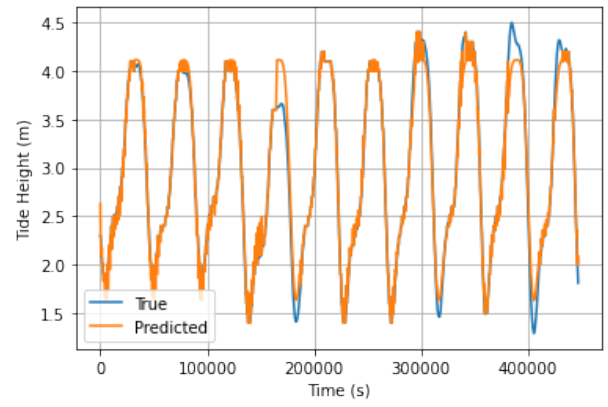
3 Exponential Sine Squared

The data set exhibits periodic behaviour, with a period of roughly 50000 seconds. Hence, we attempt to use a kernel which can model periodicity.

Figure 2a is similar to Figure 1b despite not including a White Kernel. However, the former retains the inaccurate predictions at the same points but has a lower RMS error. On the other hand, Figure 2b (RMS error of 0.192) gives the best predictions without the same errors present in Figures 1b and 2a (RMS error of 0.433). Again, including a White Kernel improved performance. These results seem to validate our assumptions that a periodic kernel would be a better model of the data.



(a) Without White Kernel (RMS error = 0.433)



(b) With White Kernel (RMS error = 0.192)

Figure 2: Predicted values