Appendix C - Prophet Model Fitting

Loading

In [8]:

```
from statsmodels.tsa.stattools import adfuller
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
from fbprophet import Prophet
```

In [9]:

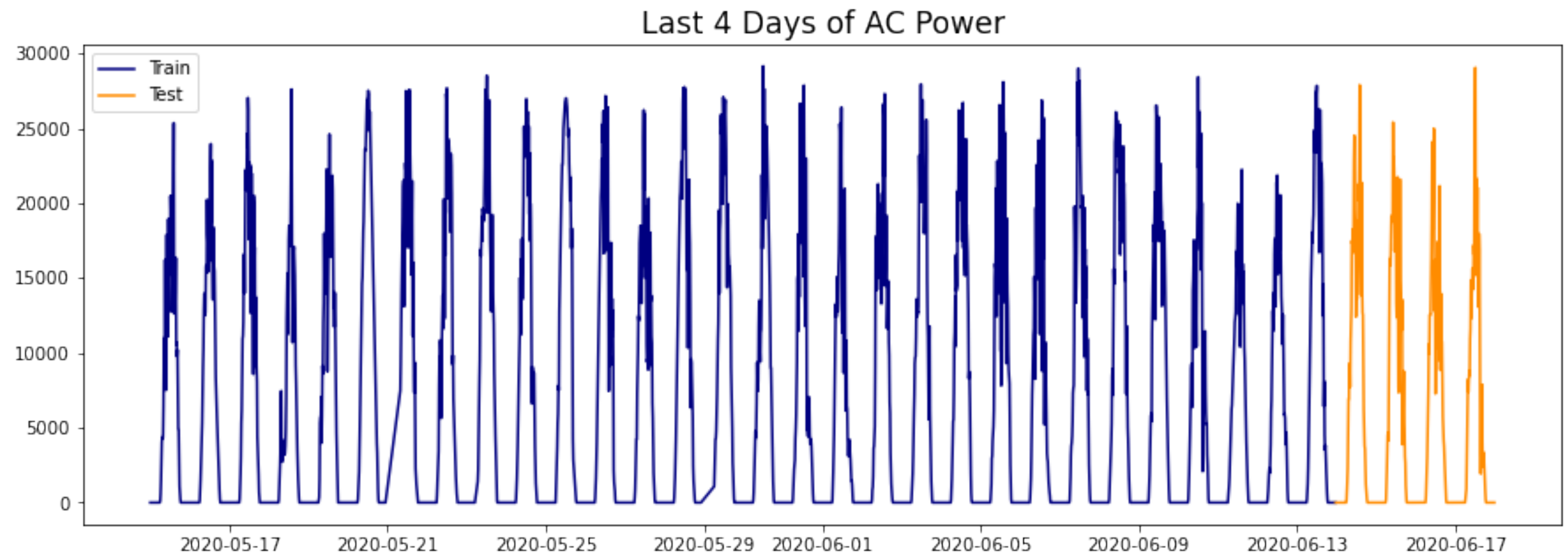
```
pred_gen = pd.read_csv('/Users/nickwawee/Desktop/BGSU/MSA_6450/Project/Data/aggregated_ac.csv')
pred_gen.drop('Unnamed: 0', axis =1 , inplace = True )
```

In [10]:

```
pred_gen.DATE_TIME = pd.to_datetime(pred_gen.DATE_TIME)
```

In [11]:

```
train=pred_gen[:(pred_gen.shape[0] - 384)]
test=pred_gen[-384:]
plt.figure(figsize=(15,5))
plt.plot(train.DATE_TIME, train.Sum_AC, label='Train',color='navy')
plt.plot(test.DATE_TIME, test.Sum_AC, label='Test',color='darkorange')
plt.title('Last 4 Days of AC Power',fontsize=17)
plt.legend()
plt.show()
```



In [15]:

```
trainnew = pd.DataFrame({'ds': train.DATE_TIME, 'y': train.Sum_AC})
m = Prophet()
m.fit(trainnew)
```

```
INFO:numexpr.utils:NumExpr defaulting to 8 threads.
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly_seasonality=True to override this.
```

Out[15]:

```
<fbprophet.forecaster.Prophet at 0x7f8b49daeeb0>
```

In [16]:

```
fut = pd.DataFrame(columns = ['ds'])
fut['ds'] = pd.concat([test.DATE_TIME, train.DATE_TIME], axis = 0)
fut
```

Out[16]:

	ds
2773	2020-06-13 23:30:00
2774	2020-06-13 23:45:00
2775	2020-06-14 00:00:00
2776	2020-06-14 00:15:00
2777	2020-06-14 00:30:00
...	...
2768	2020-06-13 22:15:00
2769	2020-06-13 22:30:00
2770	2020-06-13 22:45:00
2771	2020-06-13 23:00:00
2772	2020-06-13 23:15:00

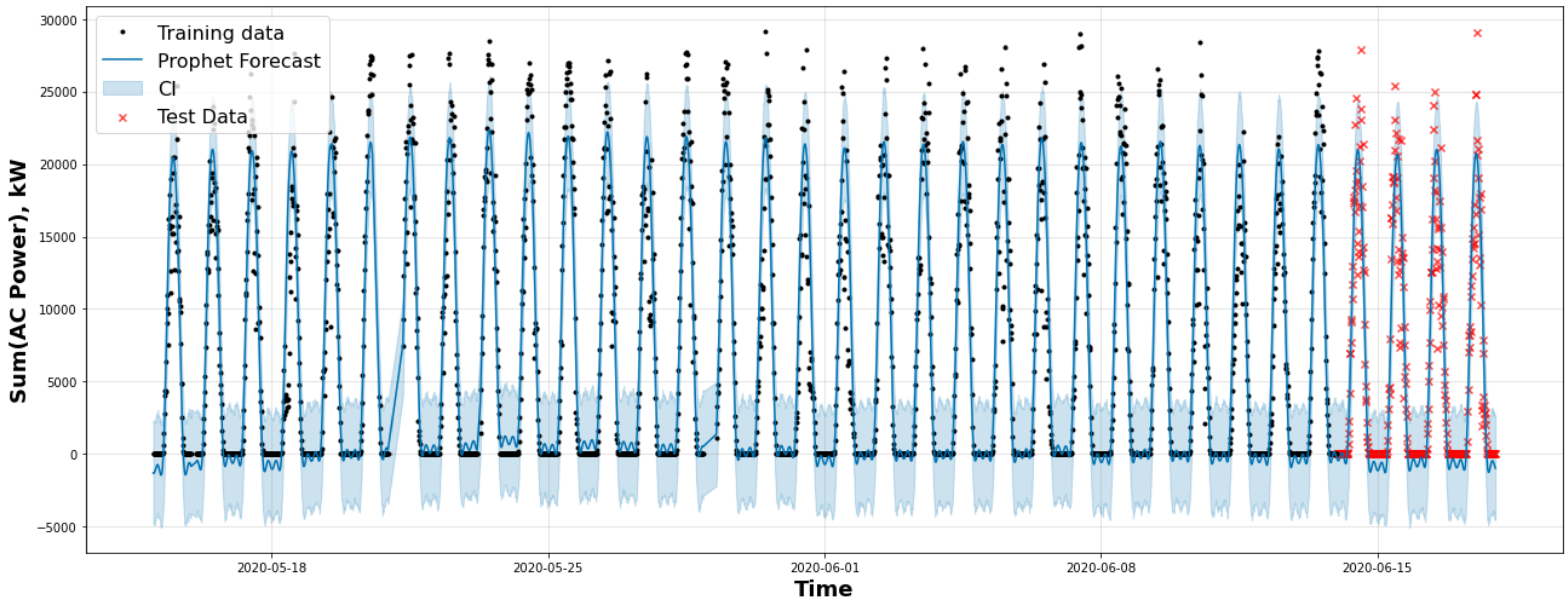
3157 rows × 1 columns

In [17]:

```
forecast = m.predict(fut)
```

In [18]:

```
m.plot(forecast,figsize=(18,7))
plt.title('ok')
plt.scatter(x = test.DATE_TIME, y = test.Sum_AC, marker = 'x', color = 'red', alpha = 0.7)
plt.legend(labels=['Training data','Prophet Forecast', 'CI','Test Data'], prop={'size': 16})
plt.title('', fontweight = 'bold', fontsize = 20)
plt.xlabel('Time', fontweight = 'bold', fontsize = 18)
plt.ylabel('Sum(AC Power), kW',fontweight = 'bold', fontsize = 18 )
plt.savefig('/Users/nickwawee/Desktop/BGSU/MSA_6450/Project/Plots/Prophet.png', dpi = 600)
plt.show()
```



In [19]:

```
rmse = np.sqrt(np.mean((forecast.yhat - test.Sum_AC)**2))
```

In [20]:

```
rmse
```

Out[20]:

```
2890.653827175155
```

In [ ]: