

Appendix

Table: ARIMA(0,1,3) without regressor

Call:

```
arima(x = max_train.ts, order = c(0, 1, 3))
```

Coefficients:

| | ma1 | ma2 | ma3 |
|------|---------|---------|---------|
| | -0.4474 | -0.3142 | -0.1827 |
| s.e. | 0.0215 | 0.0224 | 0.0210 |

Table: ARIMA(0,1,3) with 2 regressors temperature(x1) and wind speed(x2)

Call:

```
arima(x = max_train.ts, order = c(0, 1, 3), xreg = cbind(max_train$TEMP,  
max_train$Iws))
```

Coefficients:

| | ma1 | ma2 | ma3 | xreg1 | xreg2 |
|------|---------|---------|---------|--------|---------|
| | -0.4571 | -0.3027 | -0.1652 | 1.2798 | -0.4054 |
| s.e. | 0.0218 | 0.0229 | 0.0215 | 0.6576 | 0.0542 |

Table: ARIMA(1,2,2) with three regressors temperature(x1)humidity(x2)wind speed(x3)

Call:

```
arima(x = max_train.ts, order = c(1, 2, 2), xreg = cbind(max_train$TEMP,  
max_train$HUMI,  
max_train$Iws))
```

Coefficients:

| | ar1 | ma1 | ma2 | xreg1 | xreg2 | xreg3 |
|------|--------|---------|--------|---------|--------|---------|
| | 0.4621 | -1.9505 | 0.9539 | 11.3566 | 3.0884 | -0.1618 |
| s.e. | 0.0226 | 0.0084 | 0.0085 | 0.6268 | 0.1219 | 0.0491 |

Table: ARIMA(1,2,2) with four regressors temperature(x1), humidity(x2), wind speed(x3), and pressure(x4)

Call:

```
arima(x = max_train.ts, order = c(1, 2, 2), xreg = cbind(max_train$TEMP,  
max_train$HUMI,  
max_train$Iws, max_train$PRES))
```

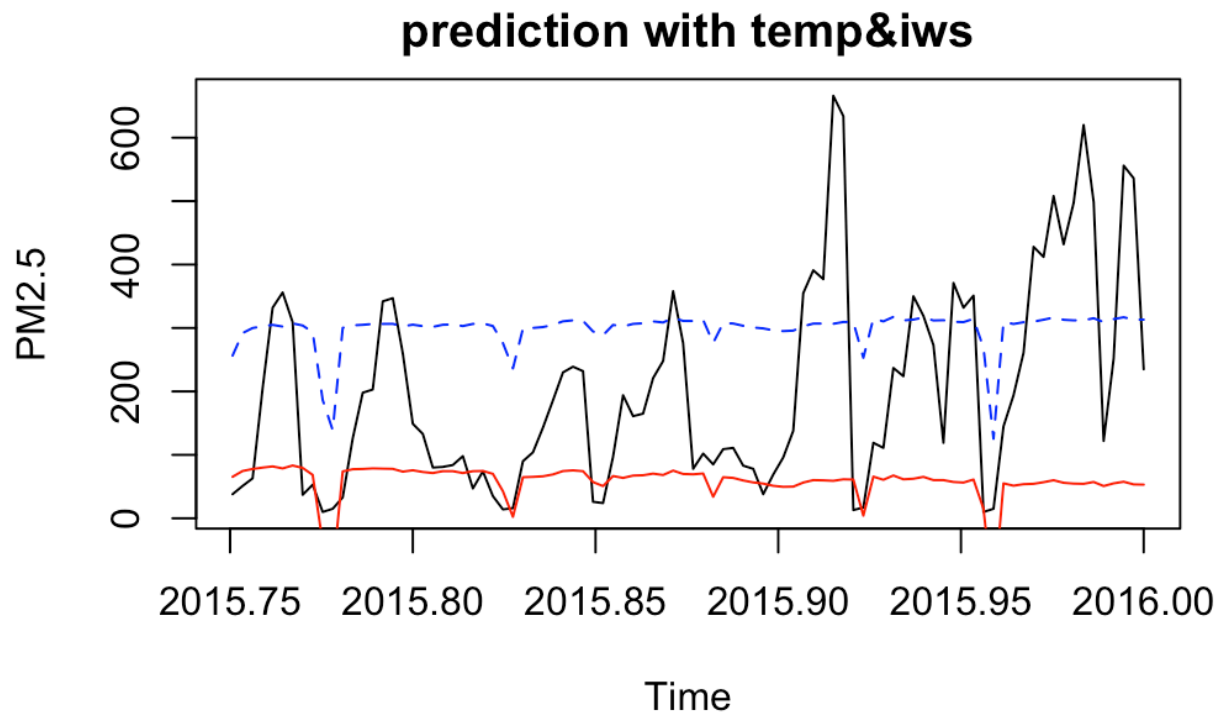
Coefficients:

| | ar1 | ma1 | ma2 | xreg1 | xreg2 | xreg3 | xreg4 |
|------|--------|---------|--------|--------|--------|---------|---------|
| | 0.4825 | -1.9550 | 0.9584 | 9.2822 | 2.7415 | -0.1348 | -3.2978 |
| s.e. | 0.0224 | 0.0079 | 0.0080 | 0.6851 | 0.1307 | 0.0484 | 0.4610 |

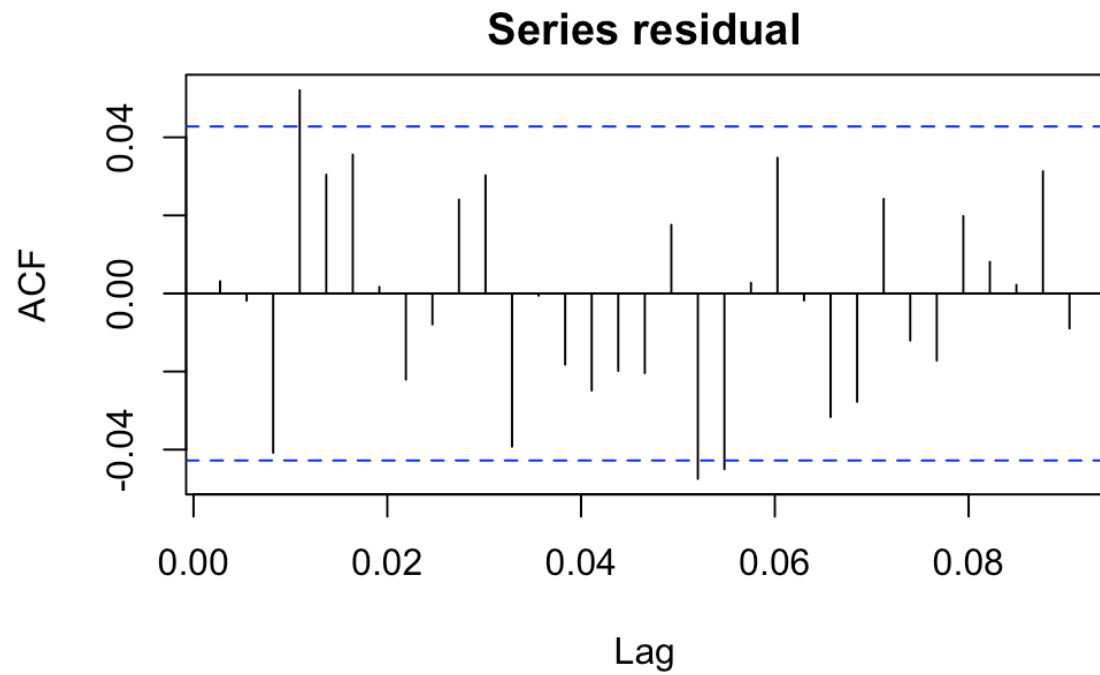
Table: MSE comparison

| ARIMA model | order | MSE |
|--|--------------|----------|
| without predictors | ARIMA(0,1,3) | 40609.34 |
| with predictors(temp,iws) | ARIMA(0,1,3) | 46297.78 |
| with predictors(temp,humi,iws) | ARIMA(1,2,2) | 28596.18 |
| with predictors(temp,humi,iws,pres) | ARIMA(1,2,2) | 21609.25 |
| with predictors(temp,humi,iws,pres,dewp) | ARIMA(1,2,2) | 21763.51 |
| with predictors(temp,humi,iws,pres,har) | ARIMA(1,1,1) | 58404.17 |

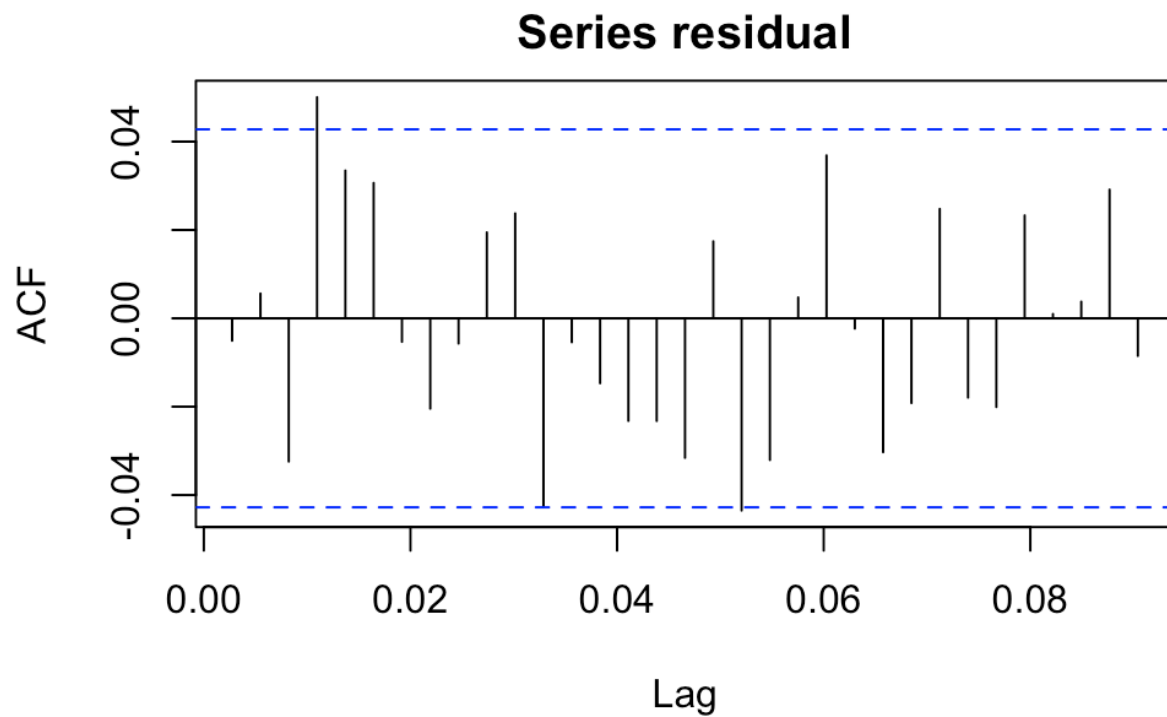
Graph: prediction with temp&iws



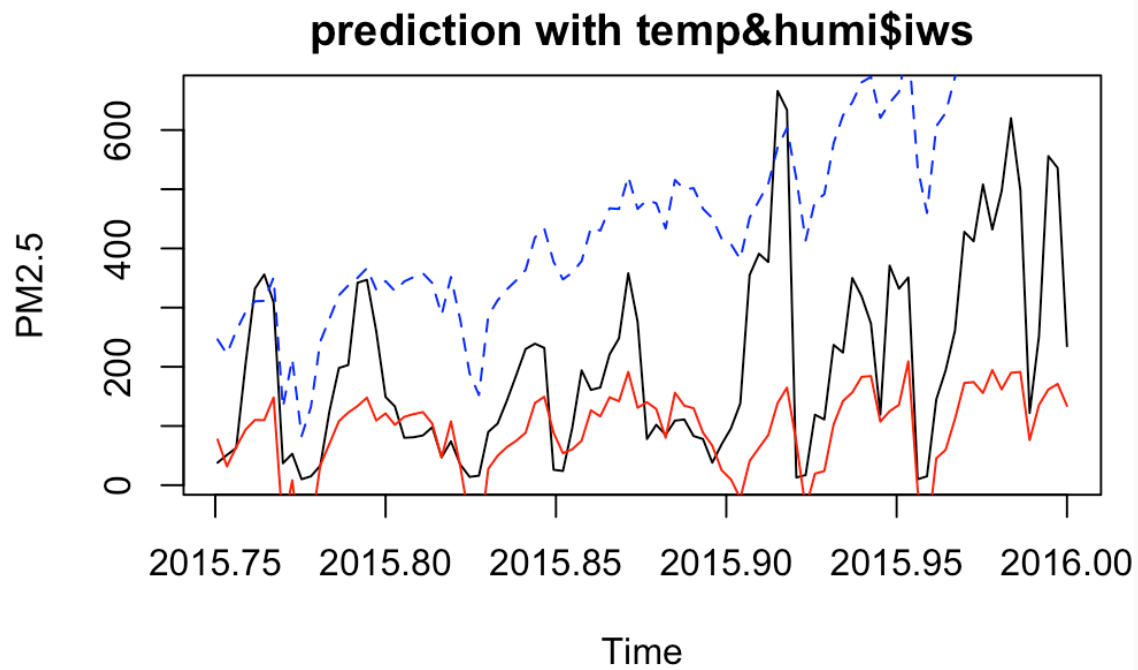
Graph: ACF of ARIMA model with temp&humi&iws



Graph: ACF of ARIMA model with temp&humi&iws&pres



Graph: prediction with temp&humi&iws



Graph: prediction with temp&humi&iws&pres

