```
            data.append(tmp)

    df = pd.DataFrame(data, columns=['col', 'best_p', 'best_q', 'best_aic', 'thre
    display(df)
"""
 - plot the ATT_FLAG=1 on the residual errors
"""
```

executed in 32m 23s, finished 20:42:42 2019-05-28

```
 ------------------ col :  L_T1  --------------------
 - ARIMA Results :  3 4  || AIC :  -13213.724391485757  (Time :  70.06
s)
  -- TP :  3  || FP :  3

 ------------------ col :  L_T2  --------------------
 - ARIMA Results :  4 4  || AIC :  -242.36991482410303  (Time :  214.6
8 s)
  -- TP :  0  || FP :  0

 ------------------ col :  L_T3  --------------------
 - ARIMA Results :  3 4  || AIC :  -7140.632981799408  (Time :  72.83
s)
  -- TP :  0  || FP :  2

 ------------------ col :  L_T4  --------------------
 - ARIMA Results :  4 2  || AIC :  8236.676581732048  (Time :  104.79
s)
  -- TP :  0  || FP :  0

 ------------------ col :  L_T5  --------------------
 - ARIMA Results :  4 4  || AIC :  -501.5571889601233  (Time :  36.92
s)
  -- TP :  0  || FP :  0

 ------------------ col :  L_T6  --------------------
 - ARIMA Results :  3 1  || AIC :  -12171.734393833129  (Time :  34.19
s)
  -- TP :  0  || FP :  1

 ------------------ col :  L_T7  --------------------
 - ARIMA Results :  3 4  || AIC :  14075.707480768035  (Time :  98.04
s)
  -- TP :  0  || FP :  0

 ------------------ col :  F_PU1  --------------------
 - ARIMA Results :  2 4  || AIC :  51640.94913827226  (Time :  85.33
s)
  -- TP :  0  || FP :  0

 ------------------ col :  S_PU1  --------------------
 - ARIMA Results :  -1 -1  || AIC :  inf  (Time :  31.84 s)

 ------------------ col :  F_PU2  --------------------
 - ARIMA Results :  1 3  || AIC :  76308.24216397341  (Time :  27.36
s)
  -- TP :  0  || FP :  0

 ------------------ col :  S_PU2  --------------------
 - ARIMA Results :  1 1  || AIC :  -3460.890907807705  (Time :  27.55
```

```
s)
  -- TP :  5  || FP :  80

 ------------------ col :  F_PU3  --------------------
 - ARIMA Results :  1 1  || AIC :  -inf  (Time :  19.09 s)
  -- TP :  219  || FP :  3958

 ------------------ col :  S_PU3  --------------------
 - ARIMA Results :  1 1  || AIC :  -inf  (Time :  18.89 s)
  -- TP :  219  || FP :  3958

 ------------------ col :  F_PU4  --------------------
 - ARIMA Results :  4 4  || AIC :  64896.16379854904  (Time :  94.15
s)
  -- TP :  0  || FP :  0

 ------------------ col :  S_PU4  --------------------
 - ARIMA Results :  4 2  || AIC :  4375.11518207259  (Time :  71.64 s)
  -- TP :  0  || FP :  0

 ------------------ col :  F_PU5  --------------------
 - ARIMA Results :  1 1  || AIC :  -inf  (Time :  17.52 s)
  -- TP :  219  || FP :  3958

 ------------------ col :  S_PU5  --------------------
 - ARIMA Results :  1 1  || AIC :  -inf  (Time :  19.95 s)
  -- TP :  219  || FP :  3958

 ------------------ col :  F_PU6  --------------------
 - ARIMA Results :  1 2  || AIC :  28590.579698764253  (Time :  36.6
s)
  -- TP :  0  || FP :  0

 ------------------ col :  S_PU6  --------------------
 - ARIMA Results :  1 2  || AIC :  -34526.35637504015  (Time :  34.8
s)
  -- TP :  8  || FP :  11

 ------------------ col :  F_PU7  --------------------
 - ARIMA Results :  3 3  || AIC :  74626.17124679718  (Time :  65.39
s)
  -- TP :  0  || FP :  0

 ------------------ col :  S_PU7  --------------------
 - ARIMA Results :  3 3  || AIC :  6289.992701872678  (Time :  58.82
s)
  -- TP :  0  || FP :  0

 ------------------ col :  F_PU8  --------------------
 - ARIMA Results :  4 2  || AIC :  67968.79587010424  (Time :  55.84
s)
  -- TP :  0  || FP :  0

 ------------------ col :  S_PU8  --------------------
 - ARIMA Results :  4 2  || AIC :  5446.161881069376  (Time :  42.0 s)
  -- TP :  0  || FP :  0

 ------------------ col :  F_PU9  --------------------
 - ARIMA Results :  1 1  || AIC :  -inf  (Time :  15.62 s)
  -- TP :  219  || FP :  3958
```

```
 ------------------ col :  S_PU9  --------------------
 - ARIMA Results :  1 1  || AIC :  -inf  (Time :  20.95 s)
  -- TP :  219  || FP :  3958

 ------------------ col :  F_PU10  --------------------
 - ARIMA Results :  4 2  || AIC :  66998.45901801047  (Time :  28.55
s)
  -- TP :  0  || FP :  0

 ------------------ col :  S_PU10  --------------------
 - ARIMA Results :  2 4  || AIC :  6674.555232985651  (Time :  38.16
s)
 - Error :  S_PU10

 ------------------ col :  F_PU11  --------------------
 - ARIMA Results :  1 1  || AIC :  7081.514647902466  (Time :  39.08
s)
  -- TP :  0  || FP :  0

 ------------------ col :  S_PU11  --------------------
 - ARIMA Results :  2 3  || AIC :  -48600.18591531503  (Time :  159.48
s)
  -- TP :  15  || FP :  6

 ------------------ col :  F_V2  --------------------
 - ARIMA Results :  4 2  || AIC :  78289.12821993689  (Time :  64.4 s)
 - Error :  F_V2

 ------------------ col :  S_V2  --------------------
 - ARIMA Results :  3 4  || AIC :  -39.12062733996936  (Time :  97.67
s)
  -- TP :  0  || FP :  0
```

	col	best_p	best_q	best_aic	threshold_train	threshold_val	val_rmse	anoma
0	L_T1	3	4	-1.321372e+04	0.568432	0.763250	0.152688	
1	L_T2	4	4	-2.423699e+02	1.190894	1.245955	0.251005	
2	L_T3	3	4	-7.140633e+03	0.824660	0.847992	0.169635	
3	L_T4	4	2	8.236677e+03	1.939595	1.971796	0.394372	
4	L_T5	4	4	-5.015572e+02	1.183157	1.183438	0.236692	
5	L_T6	3	1	-1.217173e+04	0.666650	0.740357	0.148079	
6	L_T7	3	4	1.407571e+04	2.699192	2.734036	0.546812	
7	F_PU1	2	4	5.164095e+04	23.620204	24.576335	4.915468	
8	S_PU1	-1	-1	inf	-1.000000	-1.000000	-1.000000	
9	F_PU2	1	3	7.630824e+04	93.757407	94.511367	19.007162	
10	S_PU2	1	1	-3.460891e+03	0.988651	0.996267	0.200312	
11	F_PU3	1	1	-inf	0.000000	0.000000	0.000000	
12	S_PU3	1	1	-inf	0.000000	0.000000	0.000000	
13	F_PU4	4	4	6.489616e+04	49.083590	49.374726	9.877443	
14	S_PU4	4	2	4.375115e+03	1.551560	1.582021	0.319718	
15	F_PU5	1	1	-inf	0.000000	0.000000	0.000000	
16	S_PU5	1	1	-inf	0.000000	0.000000	0.000000	

	col	best_p	best_q	best_aic	threshold_train	threshold_val	val_rmse	anoma
17	F_PU6	1	2	2.859058e+04	6.180026	17.258930	3.452702	
18	S_PU6	1	2	-3.452636e+04	0.168498	0.380323	0.076089	
19	F_PU7	3	3	7.462617e+04	85.540634	87.246695	17.450100	
20	S_PU7	3	3	6.289993e+03	1.731423	1.767426	0.353498	
21	F_PU8	4	2	6.796880e+04	58.495975	58.354535	11.670993	
22	S_PU8	4	2	5.446162e+03	1.650020	1.643095	0.328626	
23	F_PU9	1	1	-inf	0.000000	0.000000	0.000000	
24	S_PU9	1	1	-inf	0.000000	0.000000	0.000000	
25	F_PU10	4	2	6.699846e+04	55.345131	55.960752	11.192489	
26	S_PU10	2	4	6.674555e+03	1.769745	-1.000000	-1.000000	
27	F_PU11	1	1	7.081515e+03	1.811421	7.844662	1.569091	
28	S_PU11	2	3	-4.860019e+04	0.075444	0.304667	0.060938	
29	F_V2	4	2	7.828913e+04	105.455361	-1.000000	-1.000000	
30	S_V2	3	4	-3.912063e+01	1.205560	1.209198	0.241982	

Out[4]:

```
'\n - plot the ATT_FLAG=1 on the residual errors\n'
```

In [ ]:

executed in 17ms, finished 20:10:09 2019-05-28

Tmp [...]