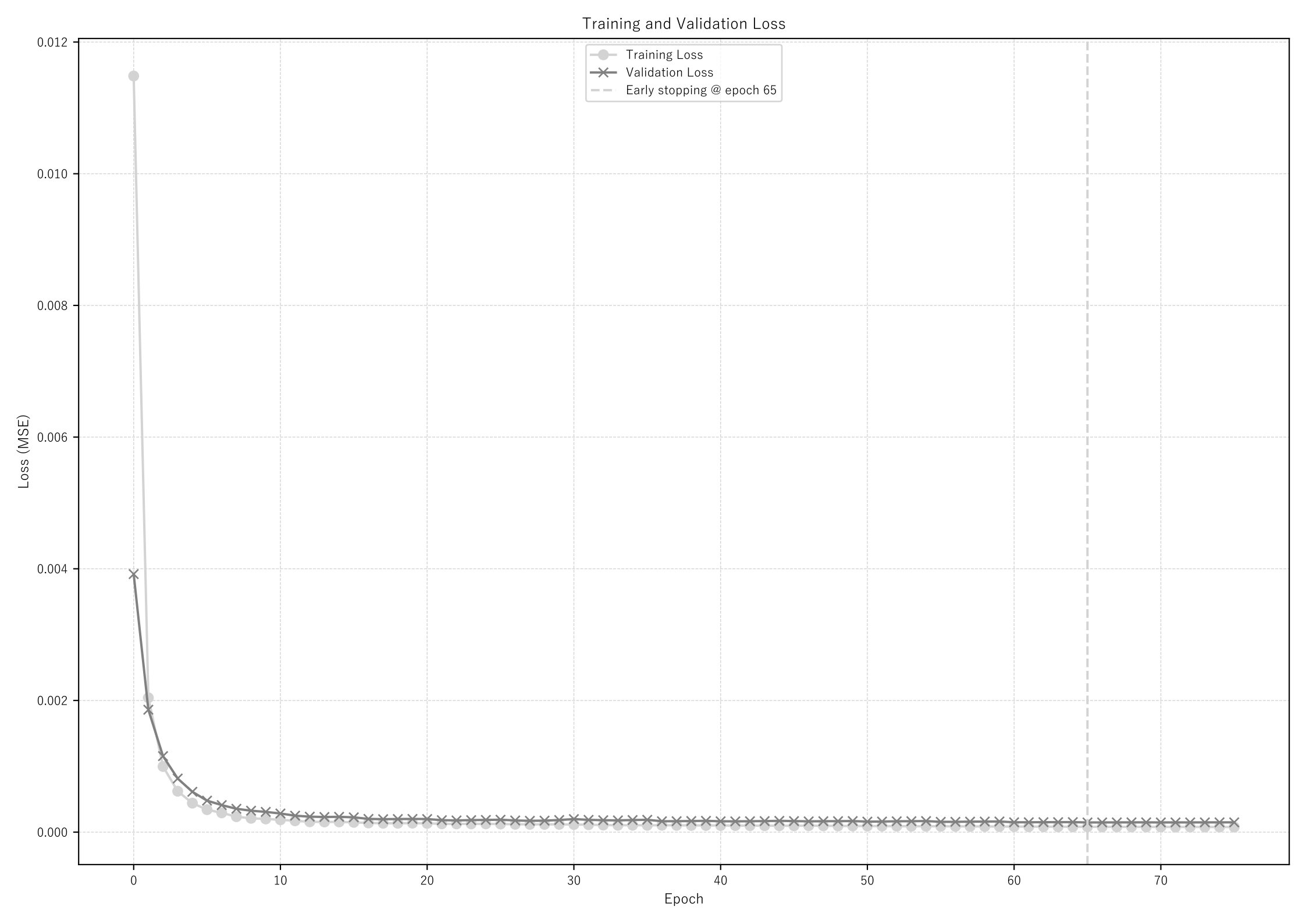
西条 - オキシダント予測の分析

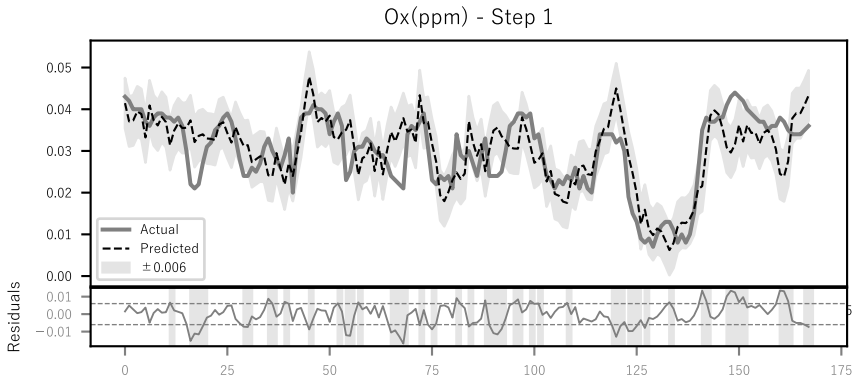
Model Parameters:
Prefecture code: 38
Station code: 38206050
Station name: 西条
Target item: Ox(ppm)
Number of data points in the train set: 15488
Number of data points in the test set: 3872
Forecast horizon (hours): 24
Model: GRU
Number of epochs: 100
Elapsed time: 52 min 44 sec
Number of used features: 163

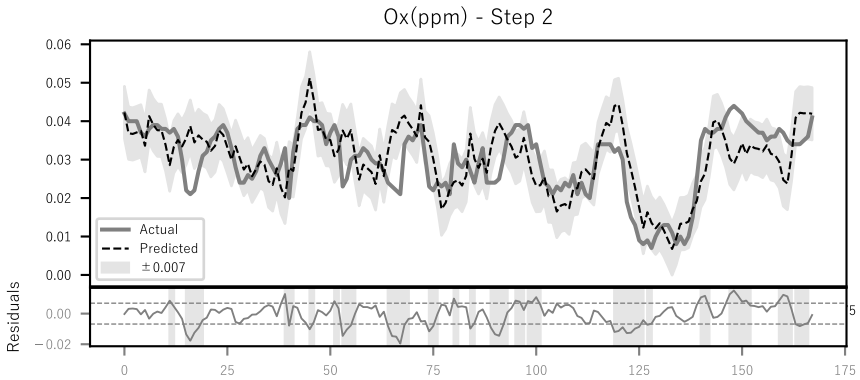
Features:
NO(ppm), NO2(ppm), NOx(ppm), U, V
Ox(ppm)_lag1, NO(ppm)_lag1, NO2(ppm)_lag1, U_lag1, V_lag1
Ox(ppm)_lag2, NO(ppm)_lag2, NO2(ppm)_lag2, U_lag2, V_lag2
Ox(ppm)_lag3, NO(ppm)_lag3, NO2(ppm)_lag3, U_lag3, V_lag3
Ox(ppm)_lag4, NO(ppm)_lag4, NO2(ppm)_lag4, U_lag4, V_lag4
Ox(ppm)_lag5, NO(ppm)_lag5, NO2(ppm)_lag5, U_lag5, V_lag5
Ox(ppm)_lag6, NO(ppm)_lag6, NO2(ppm)_lag6, U_lag6, V_lag6
Ox(ppm)_lag7, NO(ppm)_lag7, NO2(ppm)_lag7, U_lag7, V_lag7
Ox(ppm)_lag8, NO(ppm)_lag8, NO2(ppm)_lag8, U_lag8, V_lag8
Ox(ppm)_lag9, NO(ppm)_lag9, NO2(ppm)_lag9, U_lag9, V_lag9
Ox(ppm)_lag10, NO(ppm)_lag10, NO2(ppm)_lag10, U_lag10, V_lag10
Ox(ppm)_lag11, NO(ppm)_lag11, NO2(ppm)_lag11, U_lag11, V_lag11
Ox(ppm)_lag12, NO(ppm)_lag12, NO2(ppm)_lag12, U_lag12, V_lag12
Ox(ppm)_lag13, NO(ppm)_lag13, NO2(ppm)_lag13, U_lag13, V_lag13
Ox(ppm)_lag14, NO(ppm)_lag14, NO2(ppm)_lag14, U_lag14, V_lag14
Ox(ppm)_lag15, NO(ppm)_lag15, NO2(ppm)_lag15, U_lag15, V_lag15
Ox(ppm)_lag16, NO(ppm)_lag16, NO2(ppm)_lag16, U_lag16, V_lag16
Ox(ppm)_lag17, NO(ppm)_lag17, NO2(ppm)_lag17, U_lag17, V_lag17
Ox(ppm)_lag18, NO(ppm)_lag18, NO2(ppm)_lag18, U_lag18, V_lag18
Ox(ppm)_lag19, NO(ppm)_lag19, NO2(ppm)_lag19, U_lag19, V_lag19
Ox(ppm)_lag20, NO(ppm)_lag20, NO2(ppm)_lag20, U_lag20, V_lag20
Ox(ppm)_lag21, NO(ppm)_lag21, NO2(ppm)_lag21, U_lag21, V_lag21
Ox(ppm)_lag22, NO(ppm)_lag22, NO2(ppm)_lag22, U_lag22, V_lag22
Ox(ppm)_lag23, NO(ppm)_lag23, NO2(ppm)_lag23, U_lag23, V_lag23
Ox(ppm)_roll_mean_3, NO(ppm)_roll_mean_3, NO2(ppm)_roll_mean_3, U_roll_mean_3, V_roll_mean_3
Ox(ppm)_roll_std_3, NO(ppm)_roll_std_3, NO2(ppm)_roll_std_3, U_roll_std_3, V_roll_std_3
Ox(ppm)_roll_mean_6, NO(ppm)_roll_mean_6, NO2(ppm)_roll_mean_6, U_roll_mean_6, V_roll_mean_6
Ox(ppm)_roll_std_6, NO(ppm)_roll_std_6, NO2(ppm)_roll_std_6, U_roll_std_6, V_roll_std_6
Ox(ppm)_roll_mean_12, NO(ppm)_roll_mean_12, NO2(ppm)_roll_mean_12, U_roll_mean_12, V_roll_mean_12
Ox(ppm)_roll_std_12, NO(ppm)_roll_std_12, NO2(ppm)_roll_std_12, U_roll_std_12, V_roll_std_12
Ox(ppm)_diff_1, Ox(ppm)_diff_2, Ox(ppm)_diff_3, Ox(ppm)_diff_cumsum_3, NO(ppm)_diff_3
NO2(ppm)_diff_3, U_diff_3, V_diff_3, hour_sin, hour_cos
dayofweek, is_weekend, NO_ratio

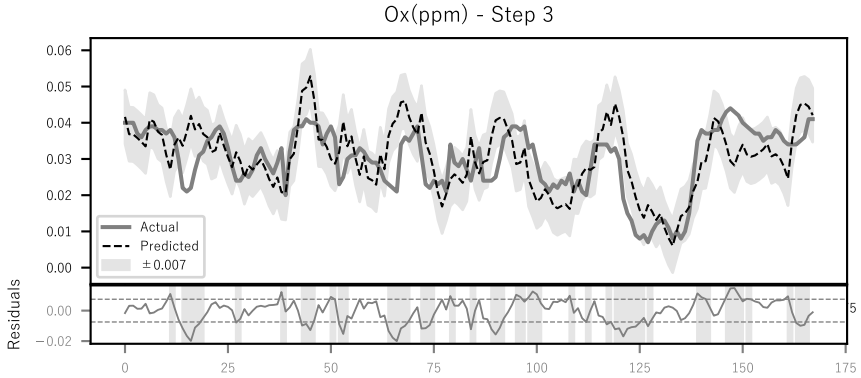
Metrics per Forecast Step:
1 - R^2: 0.7477, MAE: 0.0059, RMSE: 0.0079
2 - R^2: 0.6931, MAE: 0.0065, RMSE: 0.0087
3 - R^2: 0.6430, MAE: 0.0071, RMSE: 0.0094
4 - R^2: 0.6010, MAE: 0.0075, RMSE: 0.0099
5 - R^2: 0.5564, MAE: 0.0079, RMSE: 0.0105
6 - R^2: 0.5125, MAE: 0.0083, RMSE: 0.0110
7 - R^2: 0.4863, MAE: 0.0085, RMSE: 0.0113
8 - R^2: 0.4627, MAE: 0.0087, RMSE: 0.0115
9 - R^2: 0.4351, MAE: 0.0089, RMSE: 0.0118
10 - R^2: 0.4054, MAE: 0.0091, RMSE: 0.0121
11 - R^2: 0.3842, MAE: 0.0092, RMSE: 0.0124
12 - R^2: 0.3664, MAE: 0.0093, RMSE: 0.0125
13 - R^2: 0.3550, MAE: 0.0094, RMSE: 0.0127
14 - R^2: 0.3478, MAE: 0.0095, RMSE: 0.0127
15 - R^2: 0.3218, MAE: 0.0096, RMSE: 0.0130
16 - R^2: 0.3262, MAE: 0.0097, RMSE: 0.0129
17 - R^2: 0.3222, MAE: 0.0097, RMSE: 0.0130
18 - R^2: 0.3047, MAE: 0.0098, RMSE: 0.0131
19 - R^2: 0.2775, MAE: 0.0100, RMSE: 0.0134
20 - R^2: 0.2808, MAE: 0.0100, RMSE: 0.0134
21 - R^2: 0.2698, MAE: 0.0100, RMSE: 0.0135
22 - R^2: 0.2699, MAE: 0.0100, RMSE: 0.0135
23 - R^2: 0.2607, MAE: 0.0101, RMSE: 0.0136
24 - R^2: 0.2655, MAE: 0.0101, RMSE: 0.0135

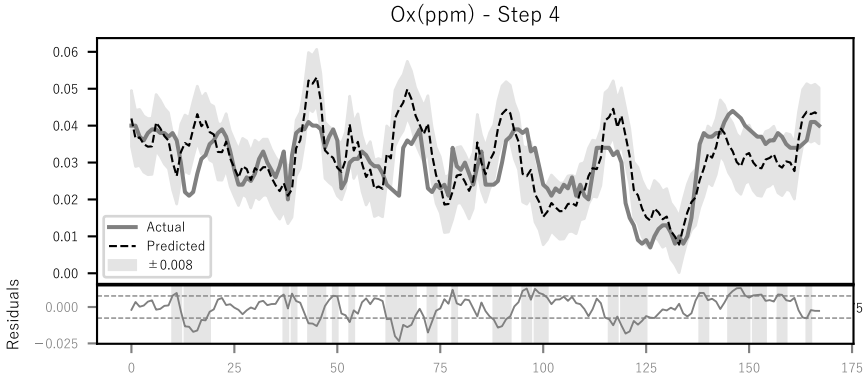

Training and Validation Loss
Training Loss
Validation Loss
Early stopping @ epoch 65
Loss (MSE)
Epoch
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
10
20
30
40
50
60
70

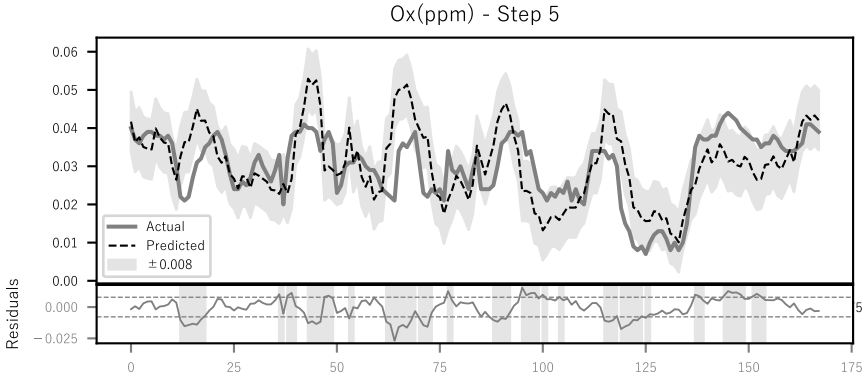
Comparison between actual and predicted values
with ± Standard Deviation Bands

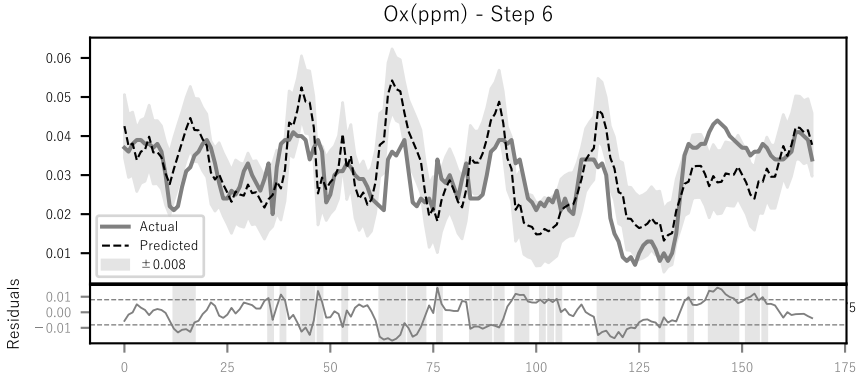




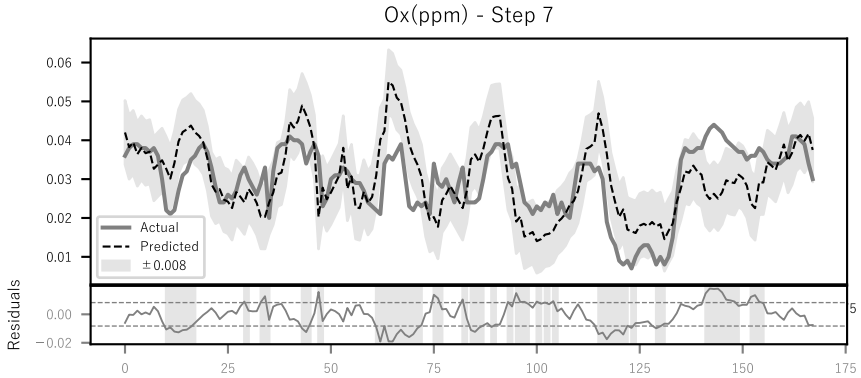


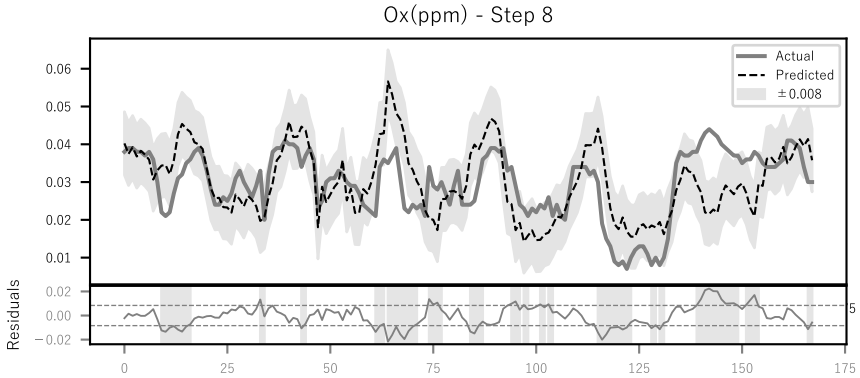


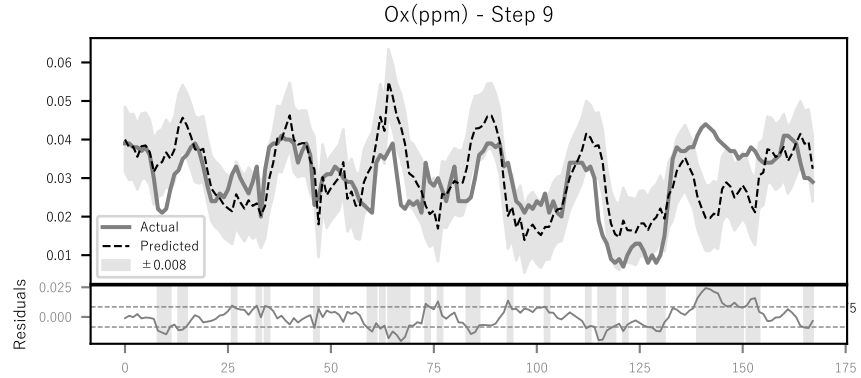


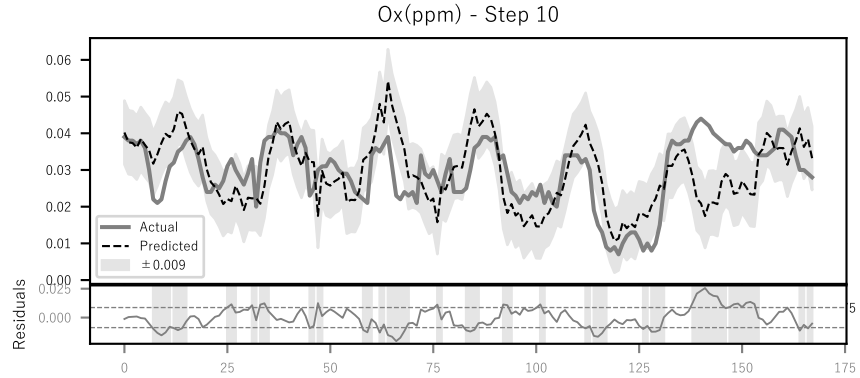


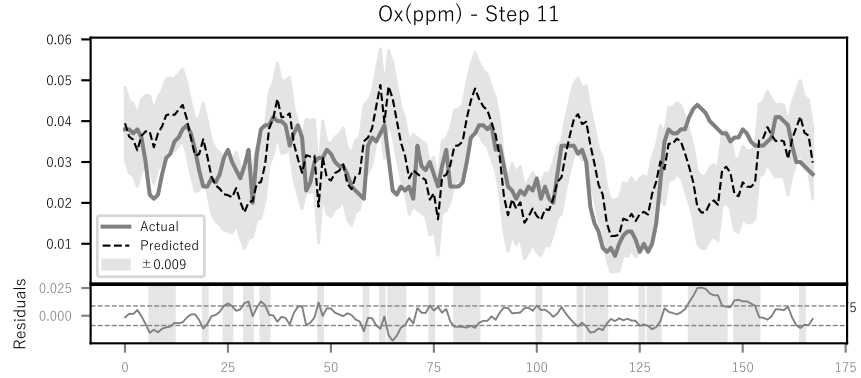
Comparison between actual and predicted values
with ± Standard Deviation Bands

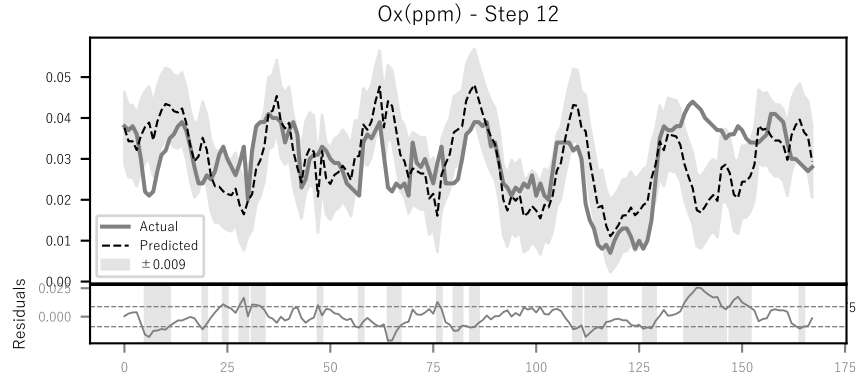




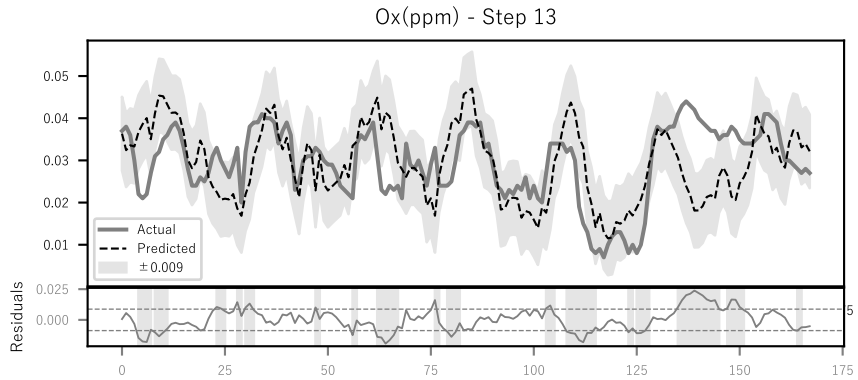


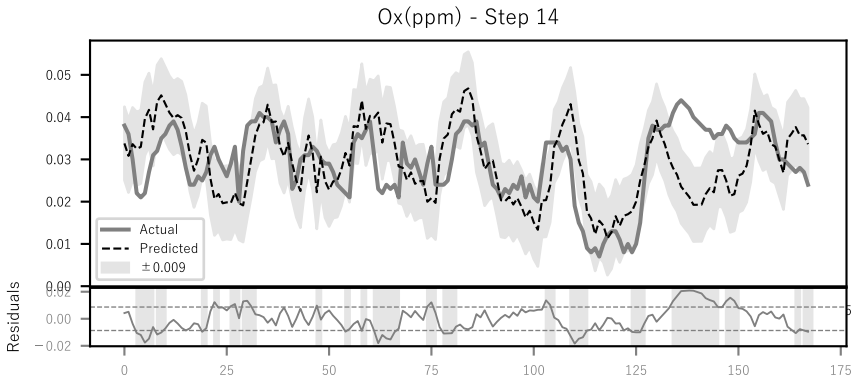


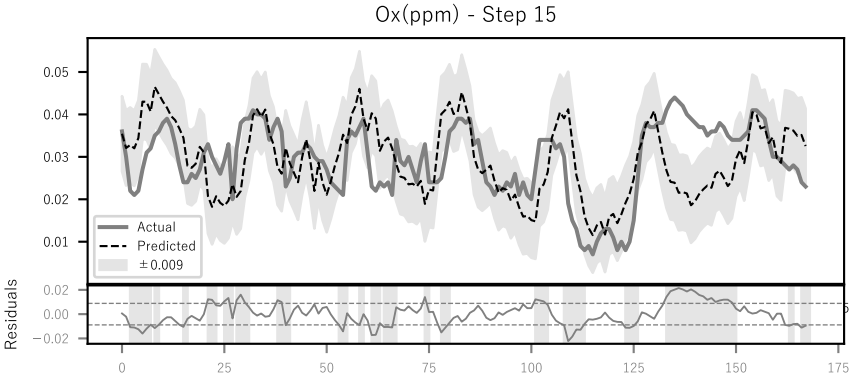


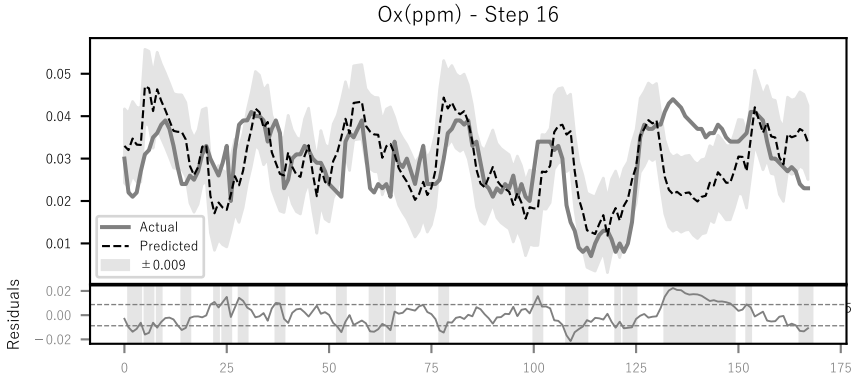


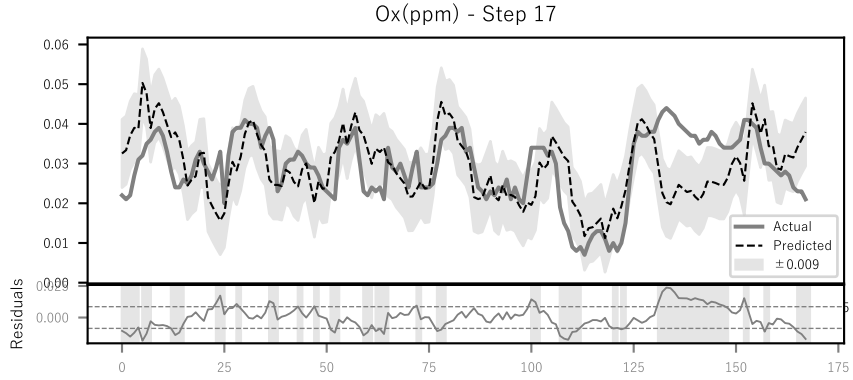
Comparison between actual and predicted values
with ± Standard Deviation Bands

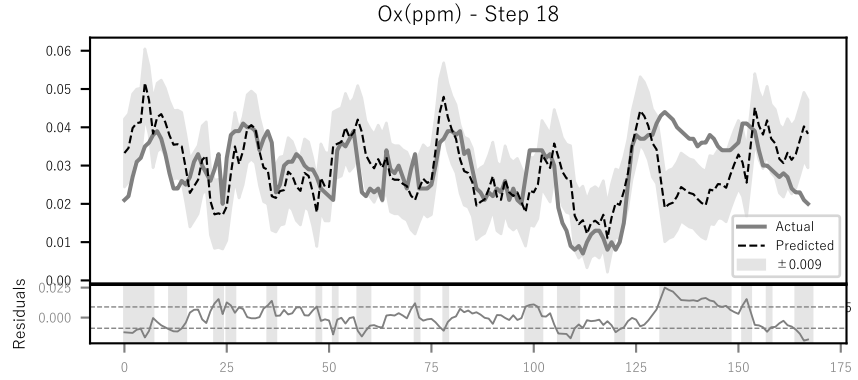




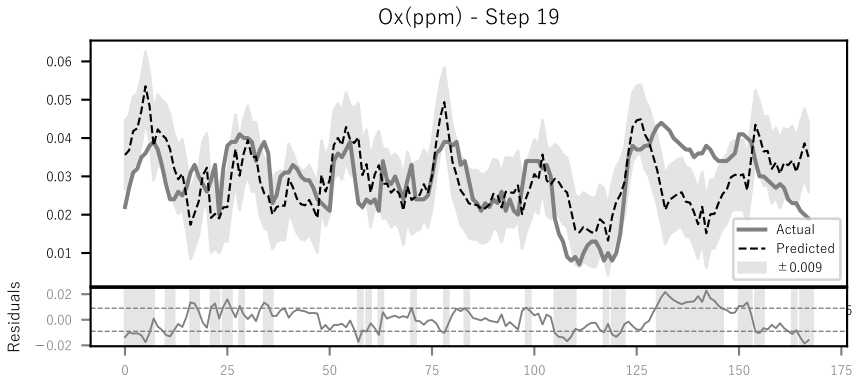


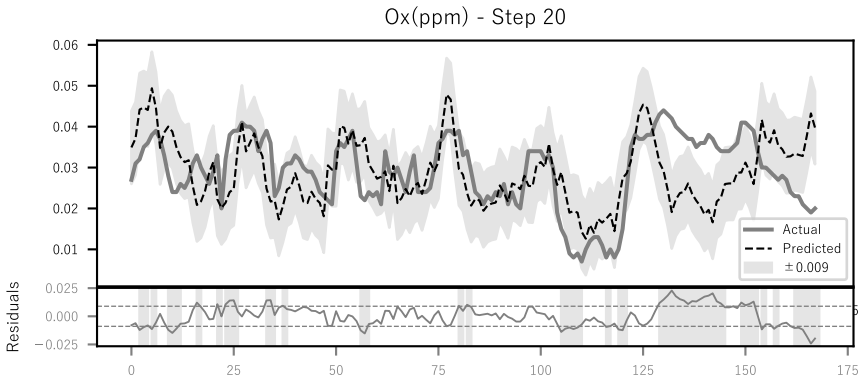


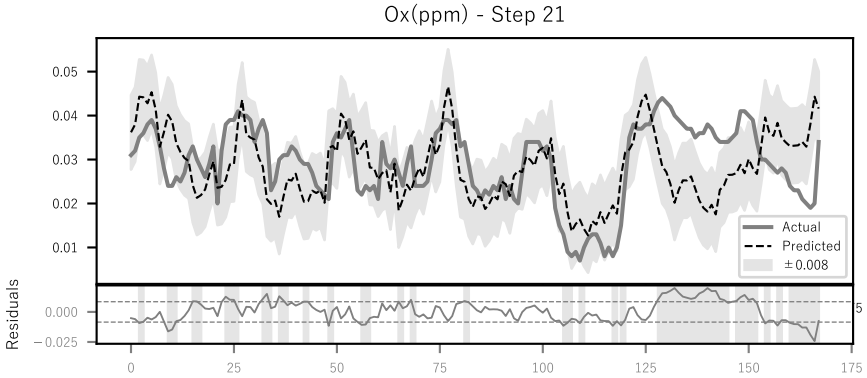


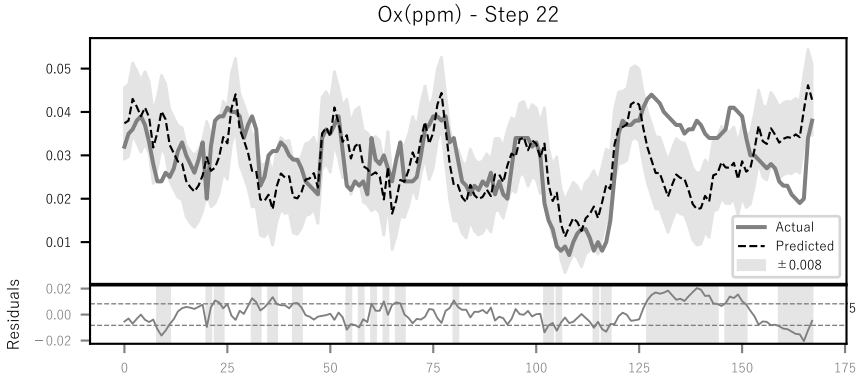


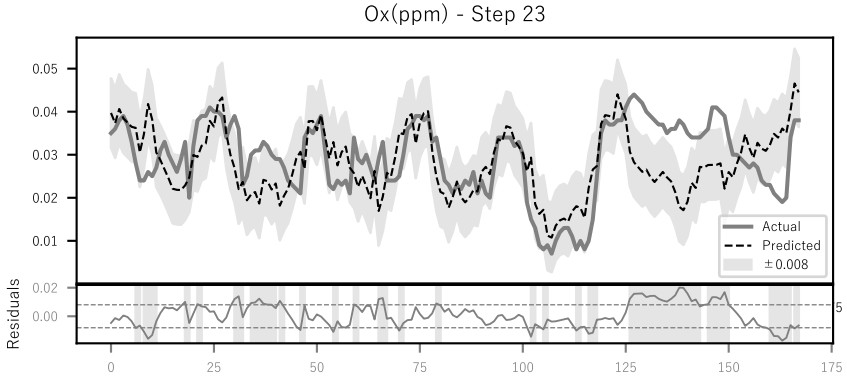
Comparison between actual and predicted values
with ± Standard Deviation Bands

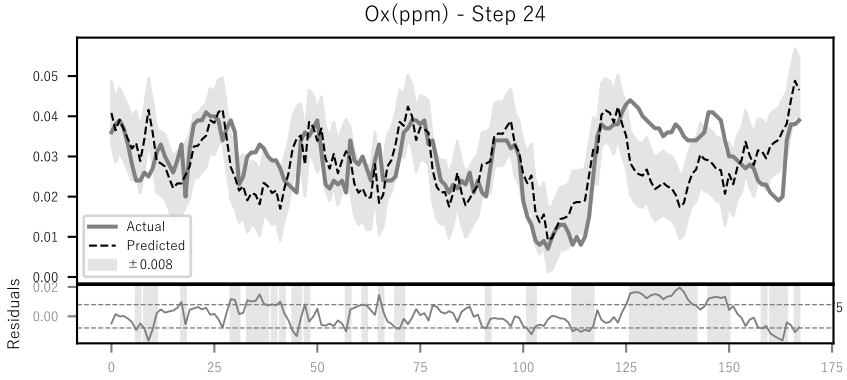


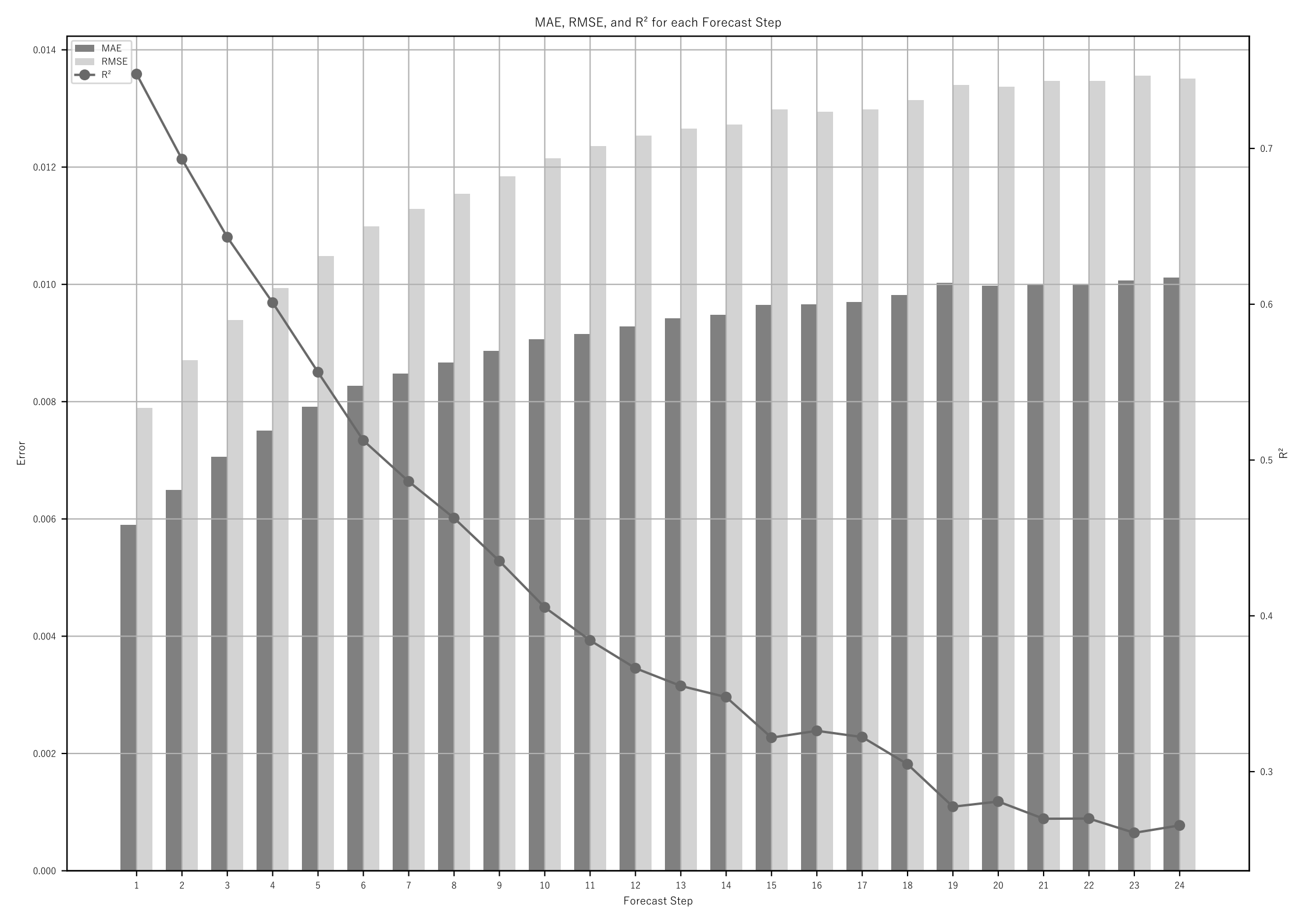











MAE, RMSE, and R² for each Forecast Step
MAE
RMSE
R²
Error
R²
Forecast Step
0.000
0.002
0.004
0.006
0.008
0.010
0.012
0.014
0.3
0.4
0.5
0.6
0.7
1
2
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