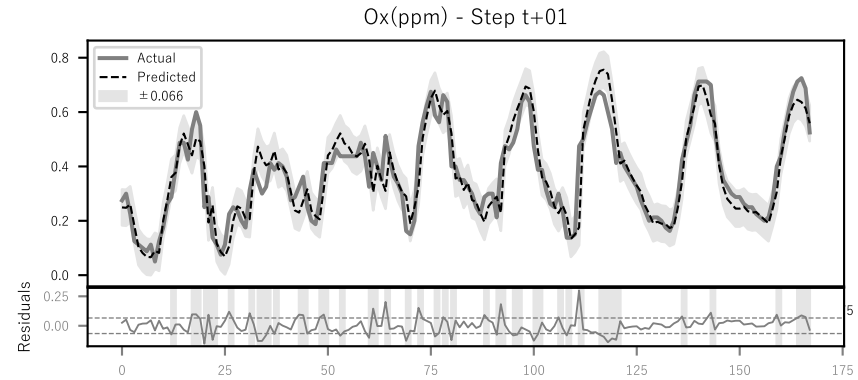
伊予三島 - オキシダント予測の分析

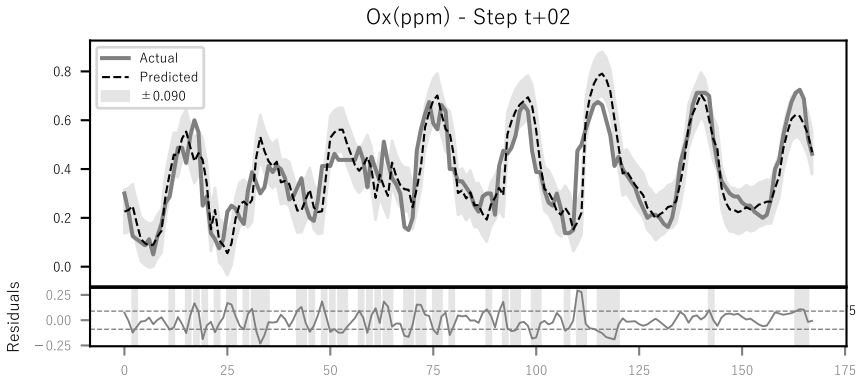
Model Parameters:
Prefecture code: 38
Station code: 38209050
Station name: 伊予三島
Target item: Ox(ppm)
Number of data points in the train set: 11998
Number of data points in the test set: 2572
Forecast horizon (hours): 24
Model: GRU
Number of epochs: 300
Elapsed time: 3 min 52 sec
Number of used features: 37

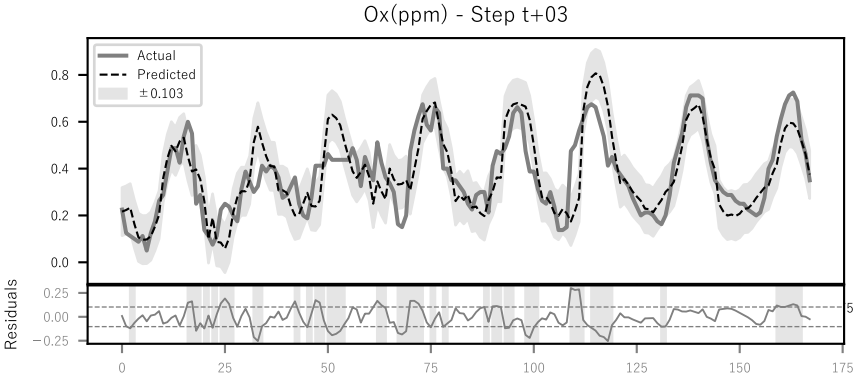
Features:
Ox(ppm), Ox(ppm)_lag1, Ox(ppm)_lag2, Ox(ppm)_lag3, NO(ppm)_lag1
NO(ppm)_lag2, NO(ppm)_lag3, NO2(ppm)_lag1, NO2(ppm)_lag2, NO2(ppm)_lag3
U_lag1, U_lag2, U_lag3, V_lag1, V_lag2
V_lag3, Ox(ppm)_roll_mean_3, Ox(ppm)_roll_std_6, NO(ppm)_roll_mean_3, NO(ppm)_roll_std_6
NO2(ppm)_roll_mean_3, NO2(ppm)_roll_std_6, U_roll_mean_3, U_roll_std_6, V_roll_mean_3
V_roll_std_6, Ox(ppm)_diff_1, Ox(ppm)_diff_2, Ox(ppm)_diff_3, NO(ppm)_diff_3
NO2(ppm)_diff_3, U_diff_3, V_diff_3, hour_sin, hour_cos
dayofweek, is_weekend

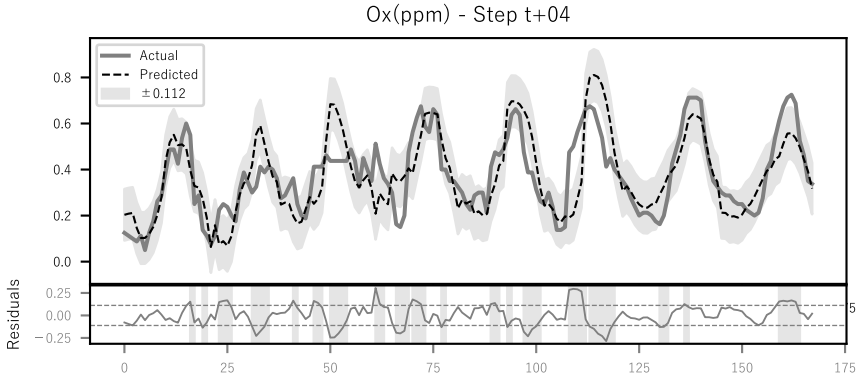
Metrics per Forecast Step:
t+01 - R^2: 0.7927, MAE: 0.0512, RMSE: 0.0666
t+02 - R^2: 0.6003, MAE: 0.0729, RMSE: 0.0925
t+03 - R^2: 0.4255, MAE: 0.0888, RMSE: 0.1109
t+04 - R^2: 0.2307, MAE: 0.1037, RMSE: 0.1283
t+05 - R^2: 0.1118, MAE: 0.1114, RMSE: 0.1378
t+06 - R^2: 0.0639, MAE: 0.1141, RMSE: 0.1414
t+07 - R^2: 0.0123, MAE: 0.1175, RMSE: 0.1451
t+08 - R^2: 0.0055, MAE: 0.1173, RMSE: 0.1455
t+09 - R^2: -0.0838, MAE: 0.1224, RMSE: 0.1518
t+10 - R^2: -0.0794, MAE: 0.1218, RMSE: 0.1514
t+11 - R^2: -0.0754, MAE: 0.1213, RMSE: 0.1510
t+12 - R^2: -0.1313, MAE: 0.1244, RMSE: 0.1549
t+13 - R^2: -0.1091, MAE: 0.1237, RMSE: 0.1533
t+14 - R^2: -0.1368, MAE: 0.1248, RMSE: 0.1552
t+15 - R^2: -0.0872, MAE: 0.1218, RMSE: 0.1518
t+16 - R^2: -0.0475, MAE: 0.1189, RMSE: 0.1490
t+17 - R^2: -0.0244, MAE: 0.1175, RMSE: 0.1474
t+18 - R^2: 0.0252, MAE: 0.1142, RMSE: 0.1437
t+19 - R^2: 0.0726, MAE: 0.1107, RMSE: 0.1402
t+20 - R^2: 0.0870, MAE: 0.1099, RMSE: 0.1390
t+21 - R^2: 0.0839, MAE: 0.1101, RMSE: 0.1392
t+22 - R^2: 0.0473, MAE: 0.1129, RMSE: 0.1419
t+23 - R^2: -0.0081, MAE: 0.1171, RMSE: 0.1460
t+24 - R^2: -0.0488, MAE: 0.1197, RMSE: 0.1489

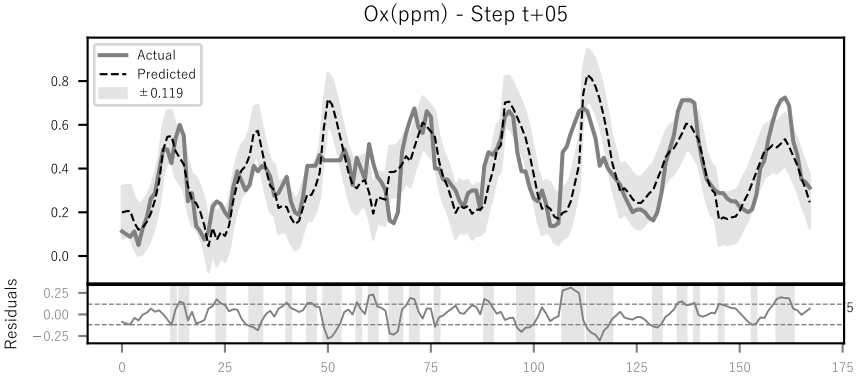
Comparison between actual and predicted values
with ± Standard Deviation Bands

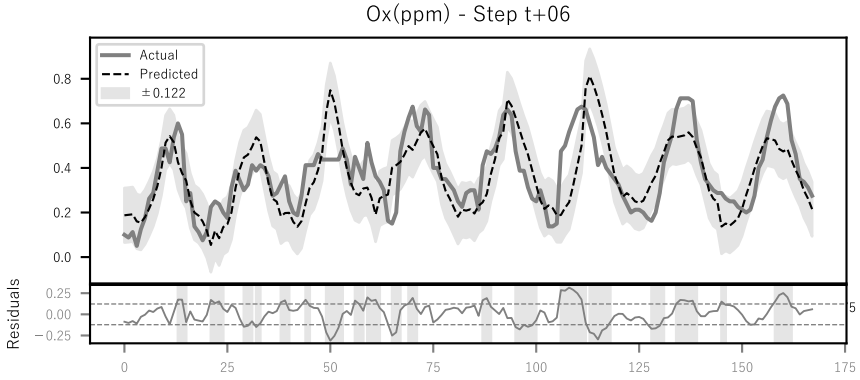






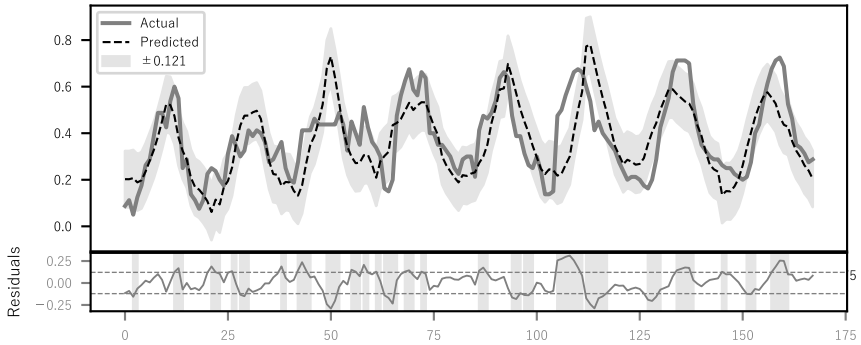




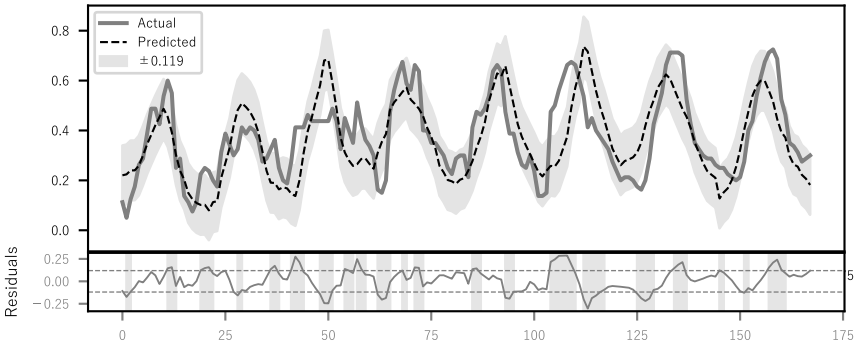


Comparison between actual and predicted values
with ± Standard Deviation Bands

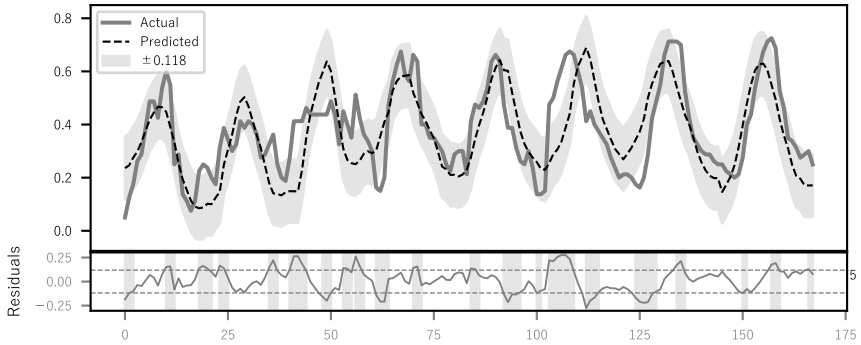
Ox(ppm) - Step t+07



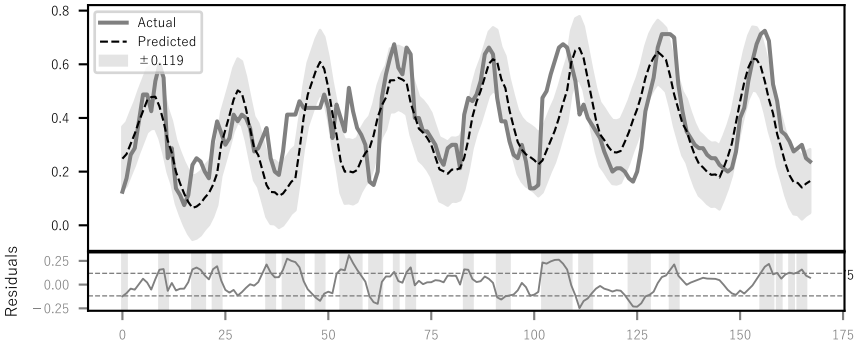
Ox(ppm) - Step t+08



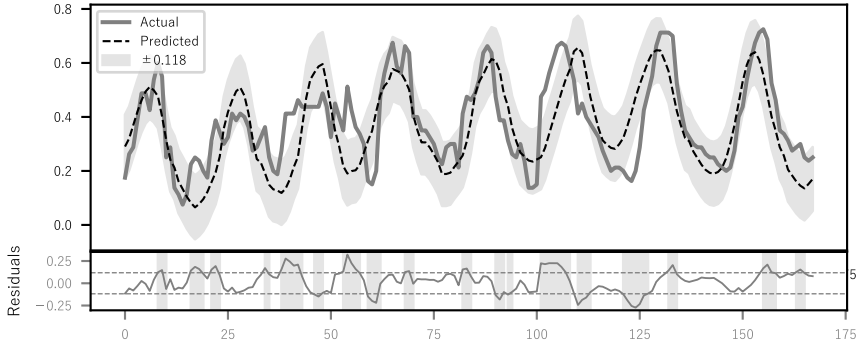
Ox(ppm) - Step t+09



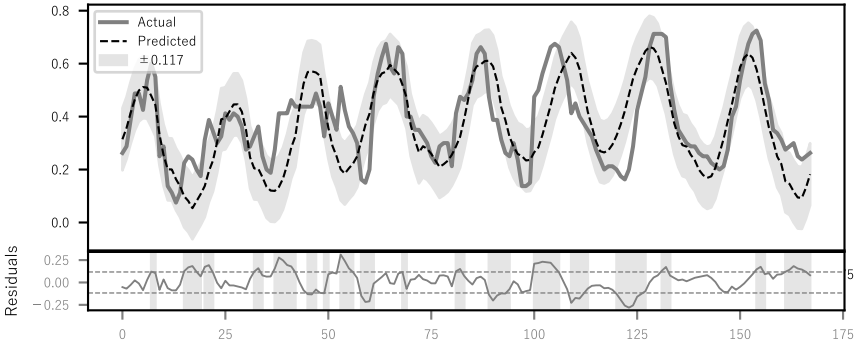
Ox(ppm) - Step t+10



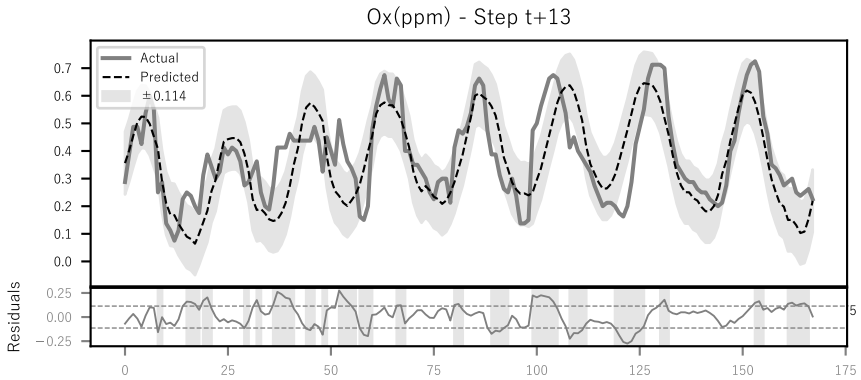
Ox(ppm) - Step t+11

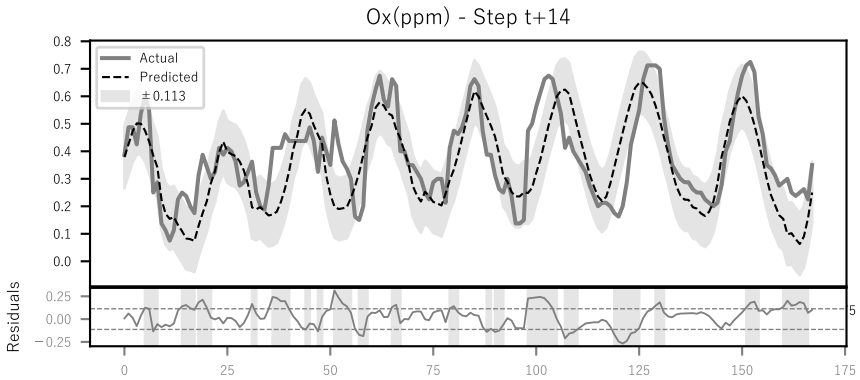


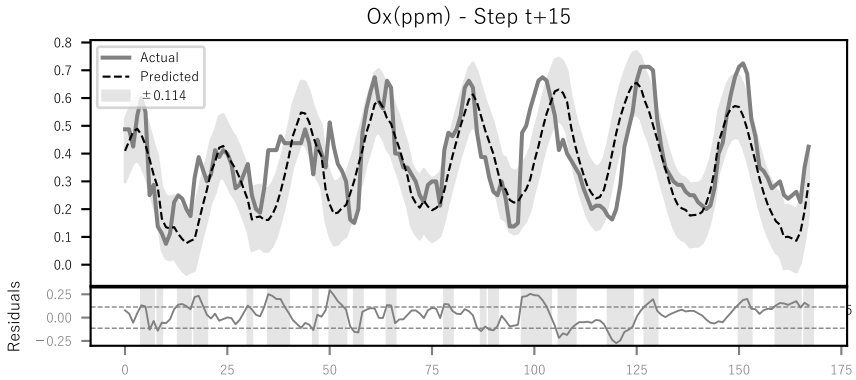
Ox(ppm) - Step t+12

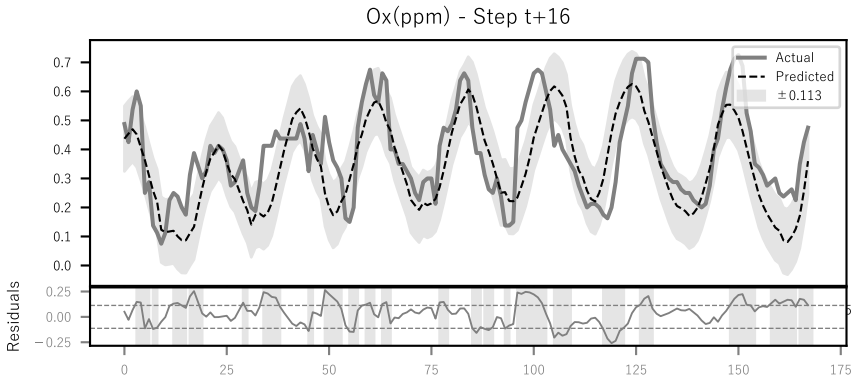


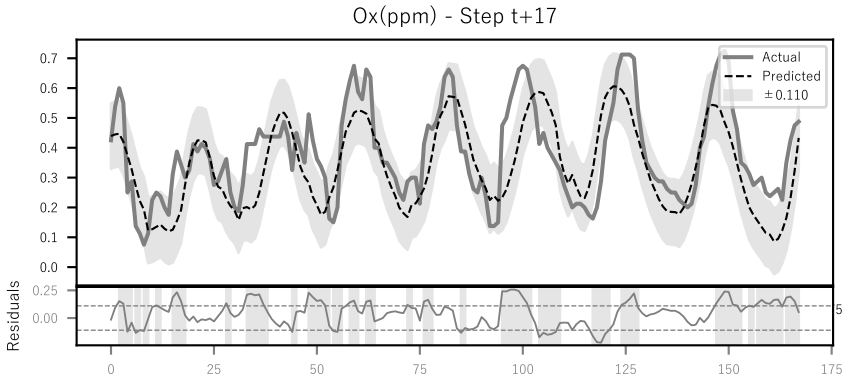
Comparison between actual and predicted values
with ± Standard Deviation Bands

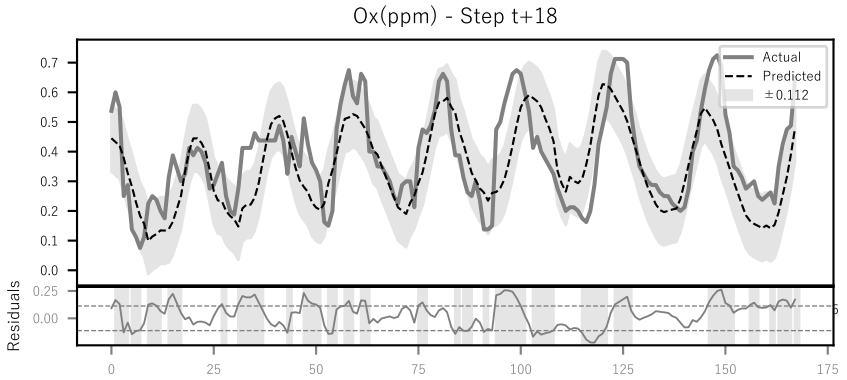




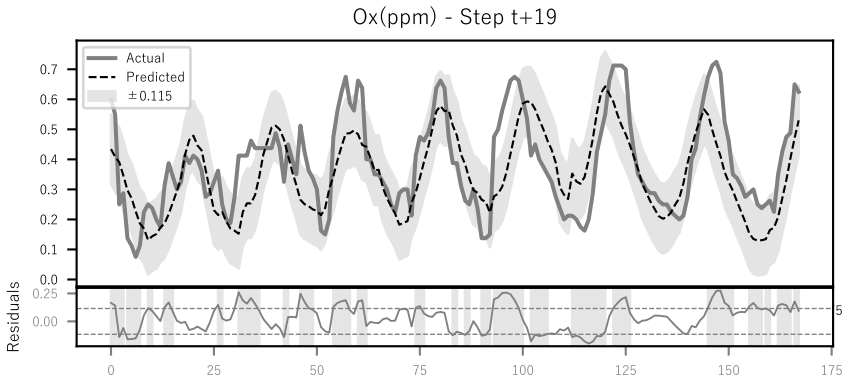


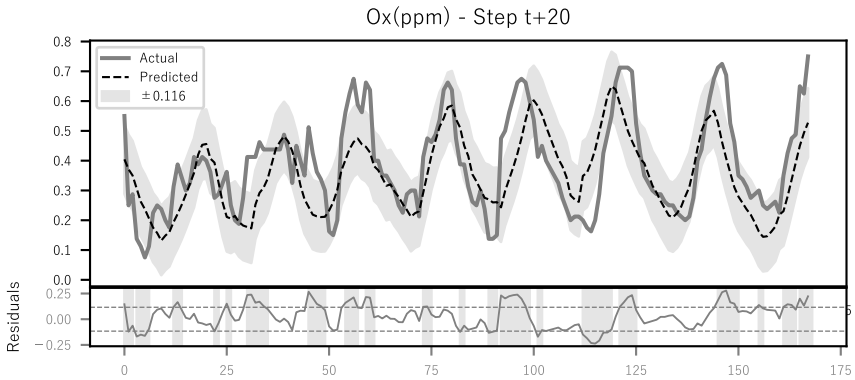


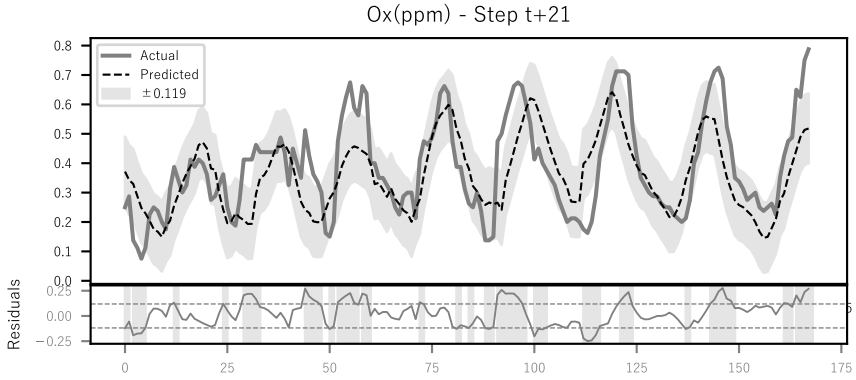


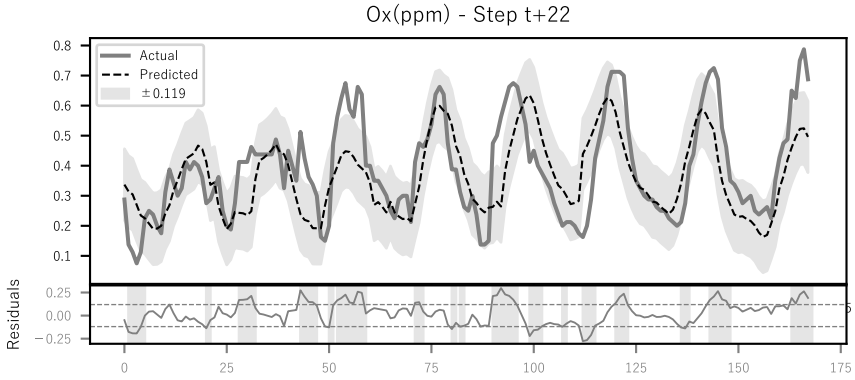


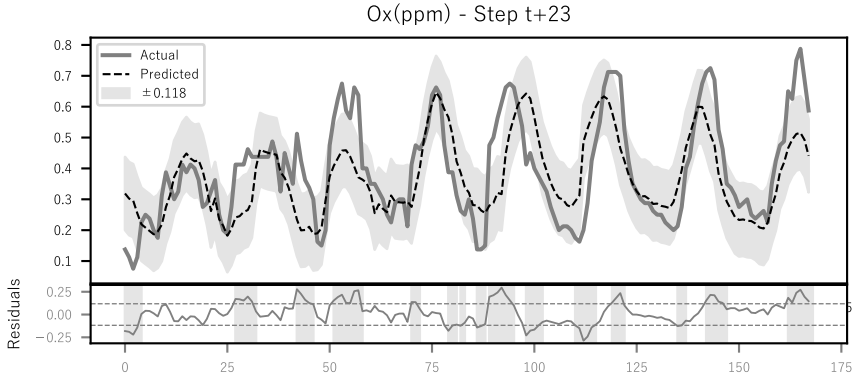
Comparison between actual and predicted values
with ± Standard Deviation Bands

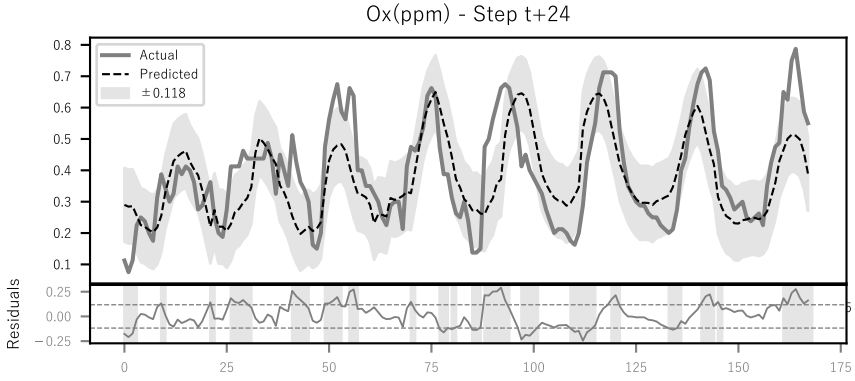


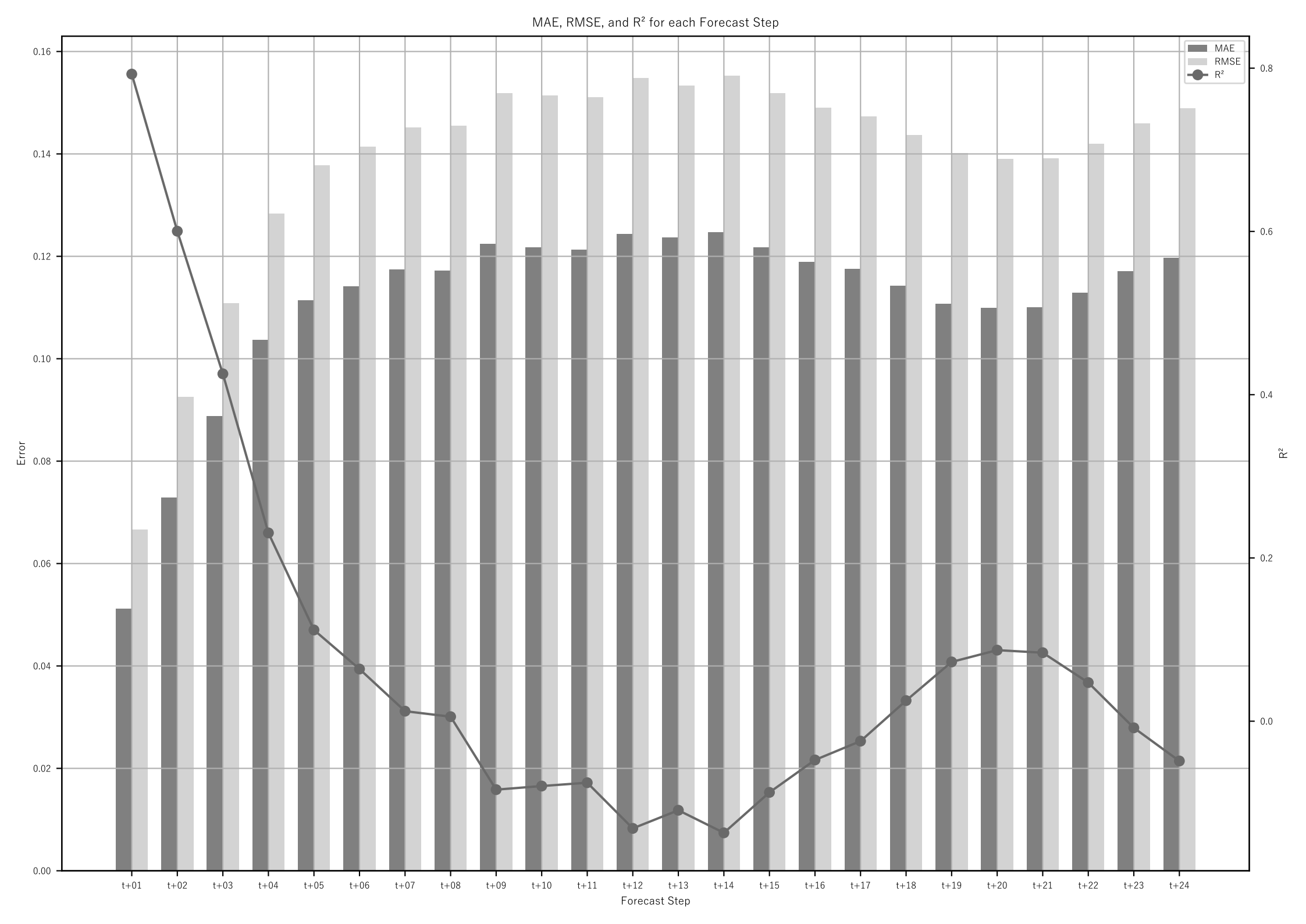











MAE, RMSE, and R² for each Forecast Step
MAE
RMSE
R²
Error
R²
Forecast Step
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
0.0
0.2
0.4
0.6
0.8
t+01
t+02
t+03
t+04
t+05
t+06
t+07
t+08
t+09
t+10
t+11
t+12
t+13
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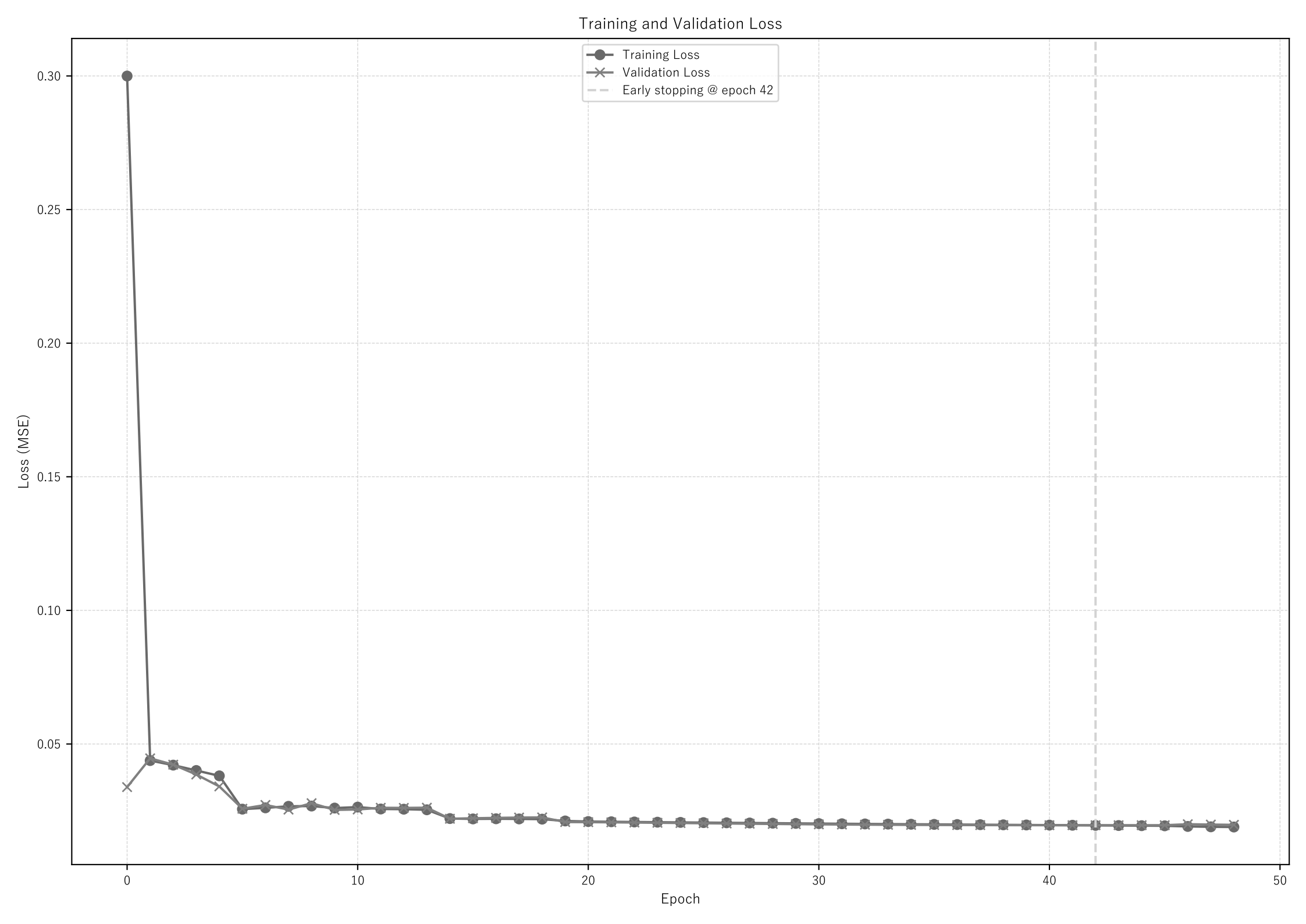
t+17
t+18
t+19
t+20
t+21
t+22
t+23
t+24


Training and Validation Loss
Training Loss
Validation Loss
Early stopping @ epoch 42
Loss (MSE)
0.30
0.25
0.20
0.15
0.10
0.05
0
10
20
30
40
50
Epoch