

# 中村 - オキシダント予測の分析

Model Parameters:  
Prefecture code: 38  
Station code: 38205060  
Station name: 中村  
Target item: Ox(ppm)  
Number of data points in the train set: 13682  
Number of data points in the test set: 5864  
Forecast horizon (hours): 24  
Model: LightGBM  
Objective: regression  
Boosting type: gbd  
Number of estimators: 400  
Learning rate: 0.04  
Elapsed time: 0 min 22 sec  
Number of used features: 140

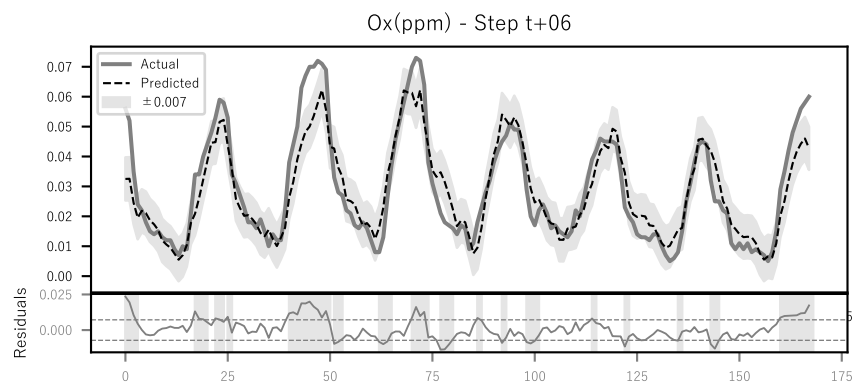
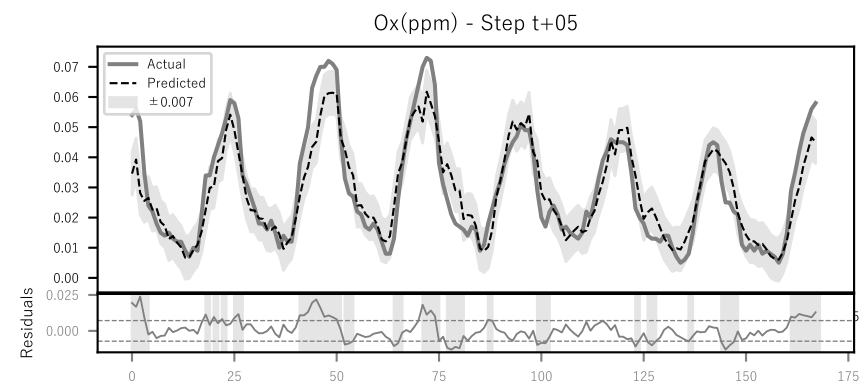
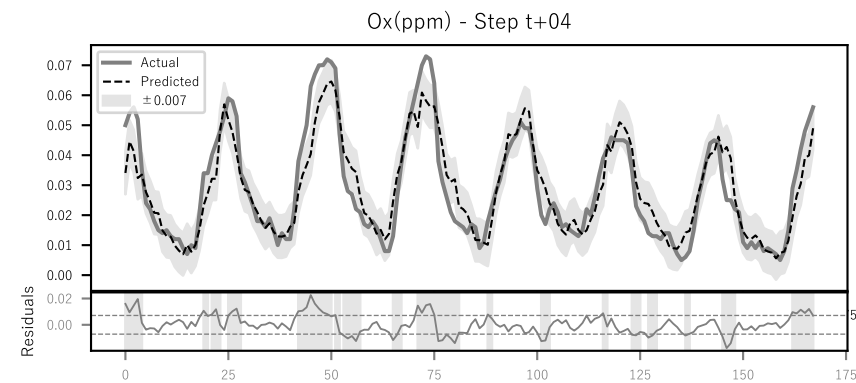
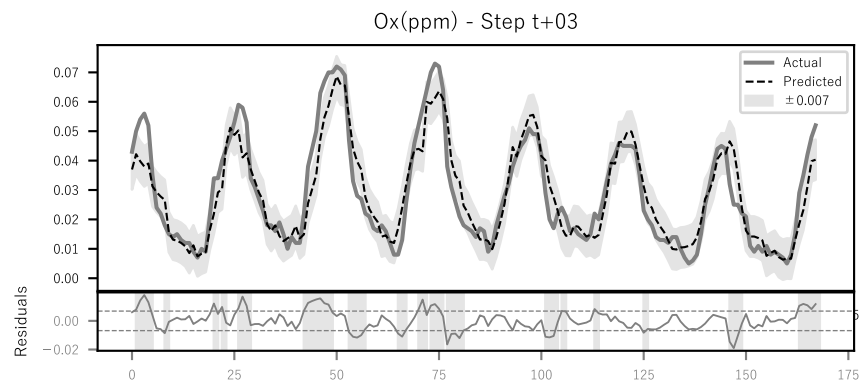
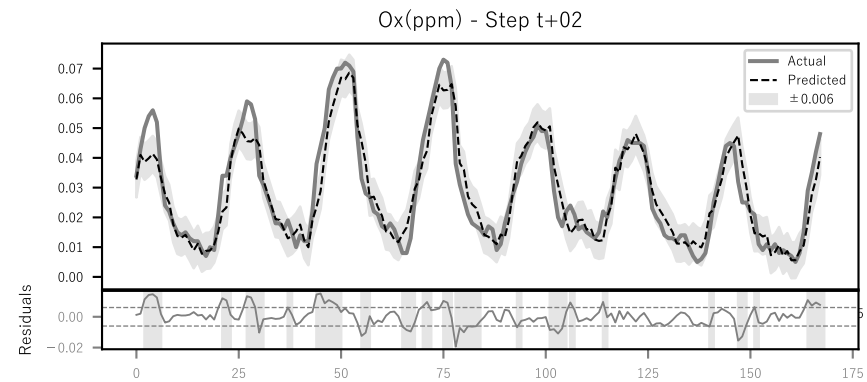
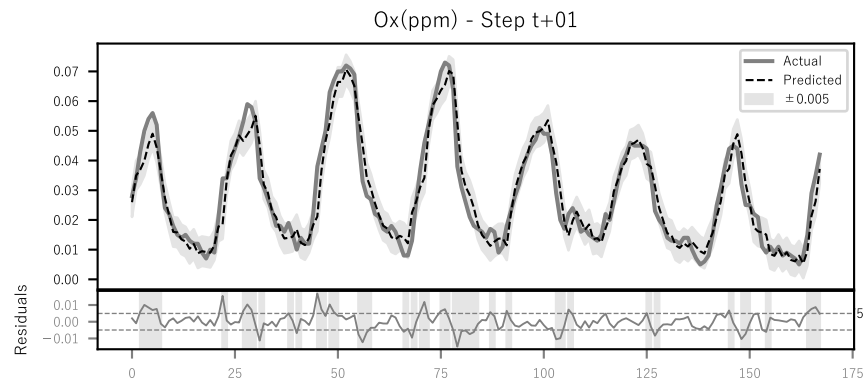
## Features:

NO(ppm), NO2(ppm), U, V, Ox(ppm)\_lag1  
Ox(ppm)\_lag2, Ox(ppm)\_lag3, Ox(ppm)\_lag4, Ox(ppm)\_lag5, Ox(ppm)\_lag6  
Ox(ppm)\_lag7, Ox(ppm)\_lag8, Ox(ppm)\_lag9, Ox(ppm)\_lag10, Ox(ppm)\_lag11  
Ox(ppm)\_lag12, Ox(ppm)\_lag13, Ox(ppm)\_lag14, Ox(ppm)\_lag15, Ox(ppm)\_lag16  
Ox(ppm)\_lag17, Ox(ppm)\_lag18, Ox(ppm)\_lag19, Ox(ppm)\_lag20, Ox(ppm)\_lag21  
Ox(ppm)\_lag22, Ox(ppm)\_lag23, NO(ppm)\_lag1, NO(ppm)\_lag2, NO(ppm)\_lag3  
NO(ppm)\_lag4, NO(ppm)\_lag5, NO(ppm)\_lag6, NO(ppm)\_lag7, NO(ppm)\_lag8  
NO(ppm)\_lag9, NO(ppm)\_lag10, NO(ppm)\_lag11, NO(ppm)\_lag12, NO(ppm)\_lag13  
NO(ppm)\_lag14, NO(ppm)\_lag15, NO(ppm)\_lag16, NO(ppm)\_lag17, NO(ppm)\_lag18  
NO(ppm)\_lag19, NO(ppm)\_lag20, NO(ppm)\_lag21, NO(ppm)\_lag22, NO(ppm)\_lag23  
NO2(ppm)\_lag1, NO2(ppm)\_lag2, NO2(ppm)\_lag3, NO2(ppm)\_lag4, NO2(ppm)\_lag5  
NO2(ppm)\_lag6, NO2(ppm)\_lag7, NO2(ppm)\_lag8, NO2(ppm)\_lag9, NO2(ppm)\_lag10  
NO2(ppm)\_lag11, NO2(ppm)\_lag12, NO2(ppm)\_lag13, NO2(ppm)\_lag14, NO2(ppm)\_lag15  
NO2(ppm)\_lag16, NO2(ppm)\_lag17, NO2(ppm)\_lag18, NO2(ppm)\_lag19, NO2(ppm)\_lag20  
NO2(ppm)\_lag21, NO2(ppm)\_lag22, NO2(ppm)\_lag23, U\_lag1, U\_lag2  
U\_lag3, U\_lag4, U\_lag5, U\_lag6, U\_lag7  
U\_lag8, U\_lag9, U\_lag10, U\_lag11, U\_lag12  
U\_lag13, U\_lag14, U\_lag15, U\_lag16, U\_lag17  
U\_lag18, U\_lag19, U\_lag20, U\_lag21, U\_lag22  
U\_lag23, V\_lag1, V\_lag2, V\_lag3, V\_lag4  
V\_lag5, V\_lag6, V\_lag7, V\_lag8, V\_lag9  
V\_lag10, V\_lag11, V\_lag12, V\_lag13, V\_lag14  
V\_lag15, V\_lag16, V\_lag17, V\_lag18, V\_lag19  
V\_lag20, V\_lag21, V\_lag22, V\_lag23, 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

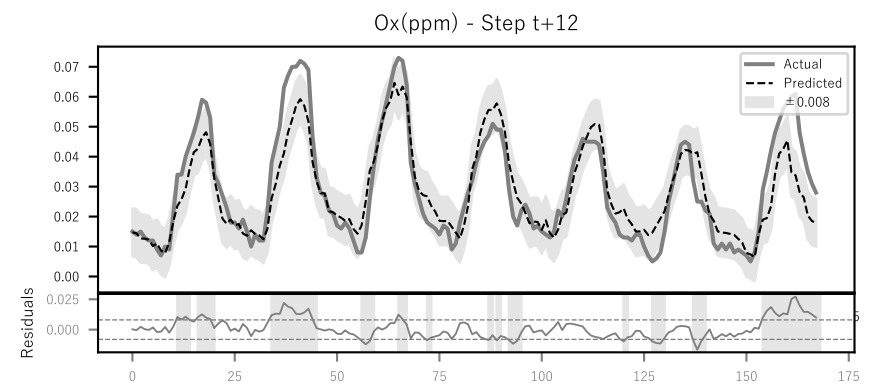
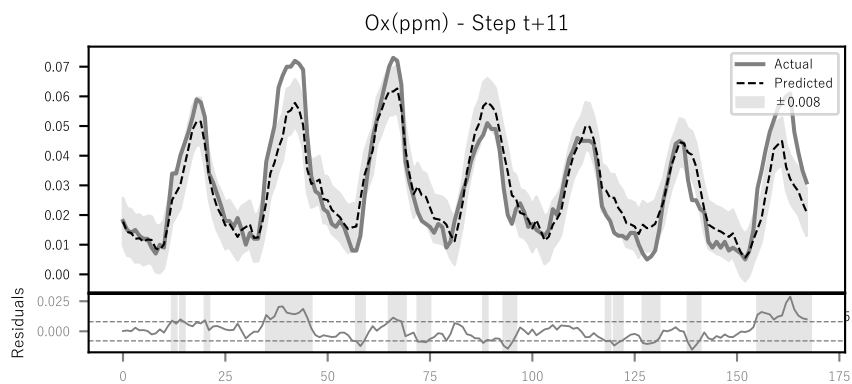
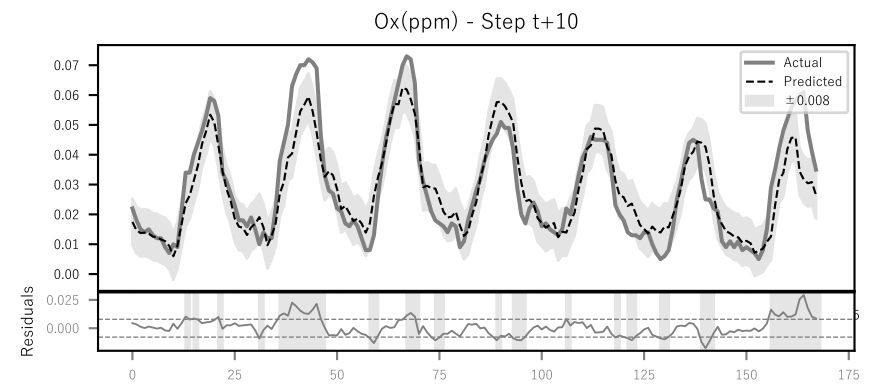
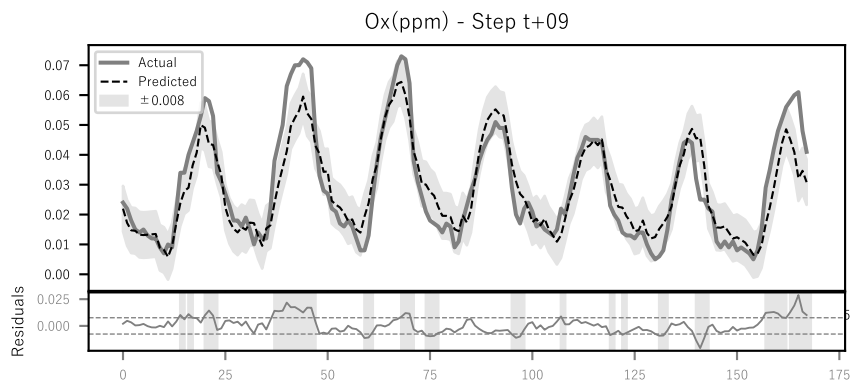
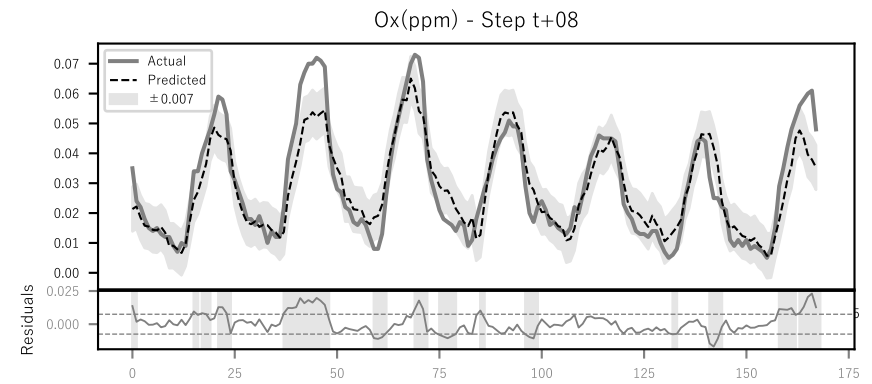
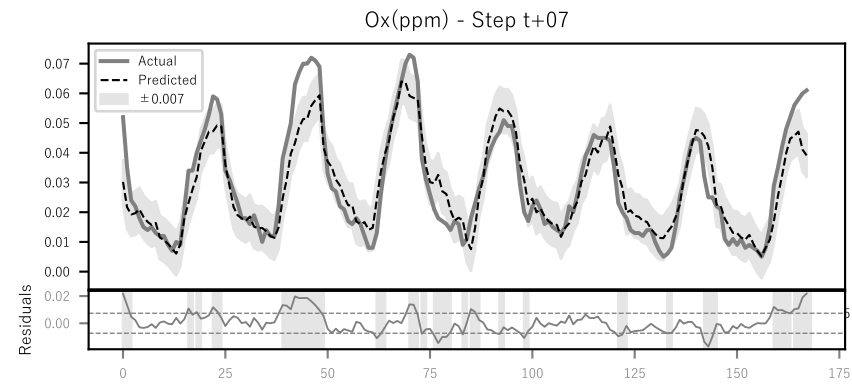
## Metrics per Forecast Step:

Ox(ppm)\_t+01 - R<sup>2</sup>: 0.8870, MAE: 0.0038, RMSE: 0.0051  
Ox(ppm)\_t+02 - R<sup>2</sup>: 0.8168, MAE: 0.0048, RMSE: 0.0065  
Ox(ppm)\_t+03 - R<sup>2</sup>: 0.7551, MAE: 0.0057, RMSE: 0.0075  
Ox(ppm)\_t+04 - R<sup>2</sup>: 0.7020, MAE: 0.0063, RMSE: 0.0083  
Ox(ppm)\_t+05 - R<sup>2</sup>: 0.6560, MAE: 0.0067, RMSE: 0.0089  
Ox(ppm)\_t+06 - R<sup>2</sup>: 0.6097, MAE: 0.0072, RMSE: 0.0095  
Ox(ppm)\_t+07 - R<sup>2</sup>: 0.5709, MAE: 0.0075, RMSE: 0.0100  
Ox(ppm)\_t+08 - R<sup>2</sup>: 0.5487, MAE: 0.0078, RMSE: 0.0102  
Ox(ppm)\_t+09 - R<sup>2</sup>: 0.5332, MAE: 0.0079, RMSE: 0.0104  
Ox(ppm)\_t+10 - R<sup>2</sup>: 0.5117, MAE: 0.0081, RMSE: 0.0106  
Ox(ppm)\_t+11 - R<sup>2</sup>: 0.4976, MAE: 0.0082, RMSE: 0.0108  
Ox(ppm)\_t+12 - R<sup>2</sup>: 0.4830, MAE: 0.0083, RMSE: 0.0110  
Ox(ppm)\_t+13 - R<sup>2</sup>: 0.4560, MAE: 0.0085, RMSE: 0.0112  
Ox(ppm)\_t+14 - R<sup>2</sup>: 0.4441, MAE: 0.0086, RMSE: 0.0114  
Ox(ppm)\_t+15 - R<sup>2</sup>: 0.4379, MAE: 0.0087, RMSE: 0.0114  
Ox(ppm)\_t+16 - R<sup>2</sup>: 0.4391, MAE: 0.0087, RMSE: 0.0114  
Ox(ppm)\_t+17 - R<sup>2</sup>: 0.4278, MAE: 0.0088, RMSE: 0.0115  
Ox(ppm)\_t+18 - R<sup>2</sup>: 0.4151, MAE: 0.0088, RMSE: 0.0117  
Ox(ppm)\_t+19 - R<sup>2</sup>: 0.4123, MAE: 0.0088, RMSE: 0.0117  
Ox(ppm)\_t+20 - R<sup>2</sup>: 0.4113, MAE: 0.0088, RMSE: 0.0117  
Ox(ppm)\_t+21 - R<sup>2</sup>: 0.4008, MAE: 0.0089, RMSE: 0.0118  
Ox(ppm)\_t+22 - R<sup>2</sup>: 0.4066, MAE: 0.0089, RMSE: 0.0117  
Ox(ppm)\_t+23 - R<sup>2</sup>: 0.3994, MAE: 0.0089, RMSE: 0.0118  
Ox(ppm)\_t+24 - R<sup>2</sup>: 0.3955, MAE: 0.0091, RMSE: 0.0119

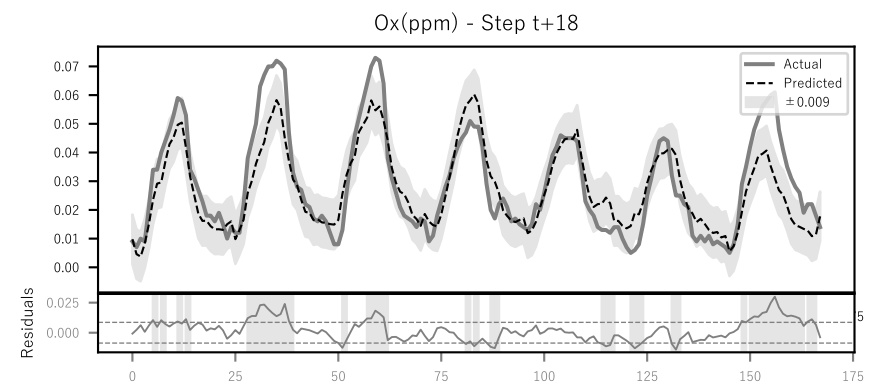
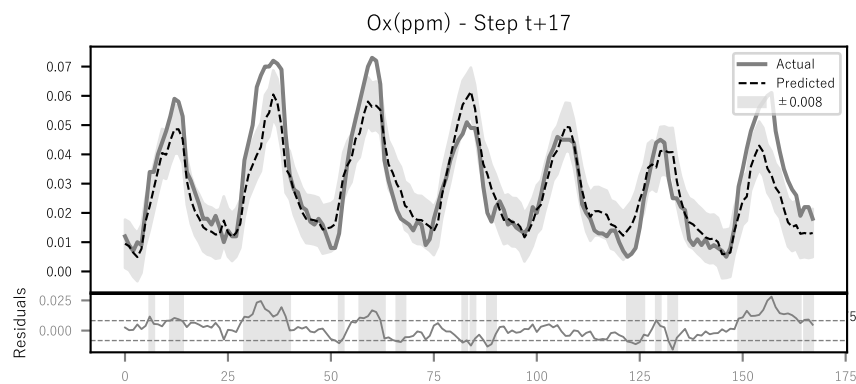
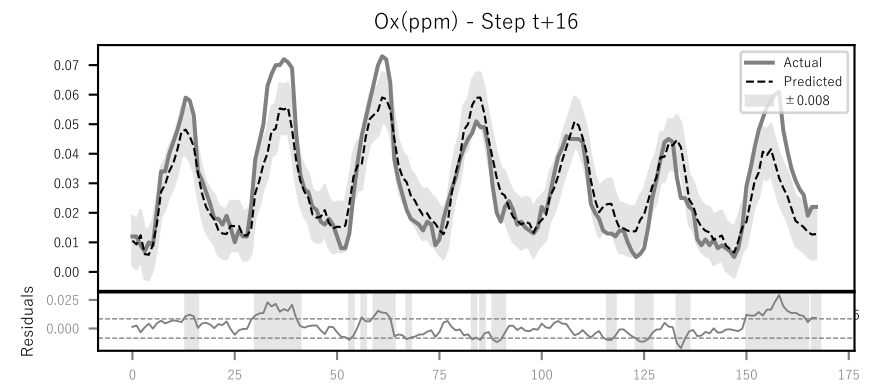
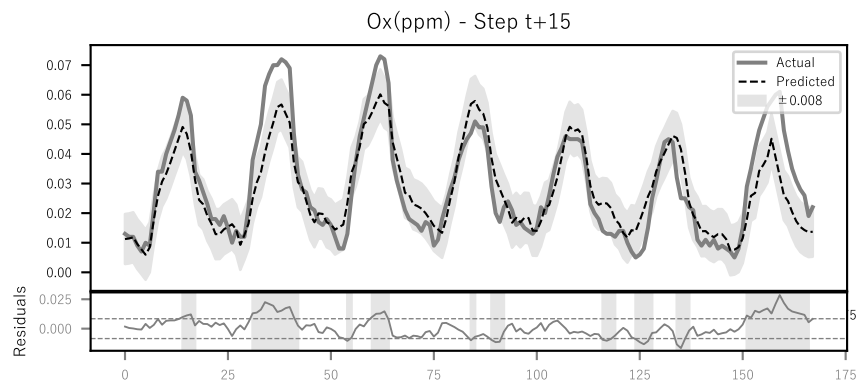
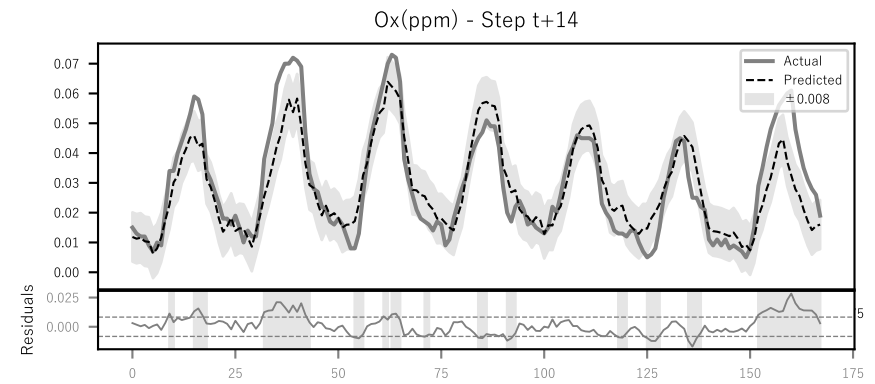
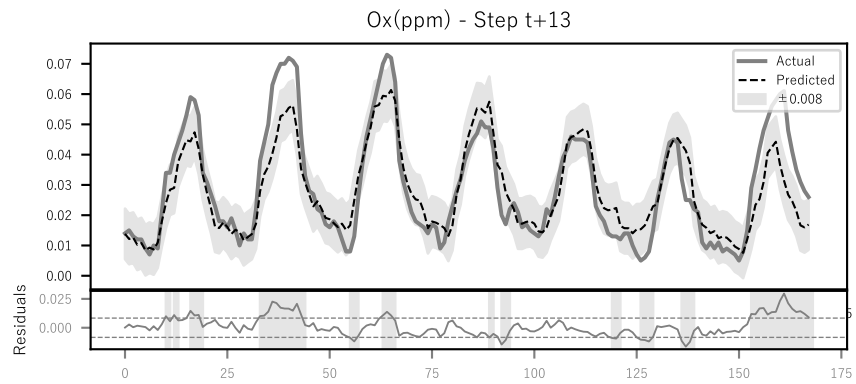
Comparison between actual and predicted values  
with  $\pm$  Standard Deviation Bands



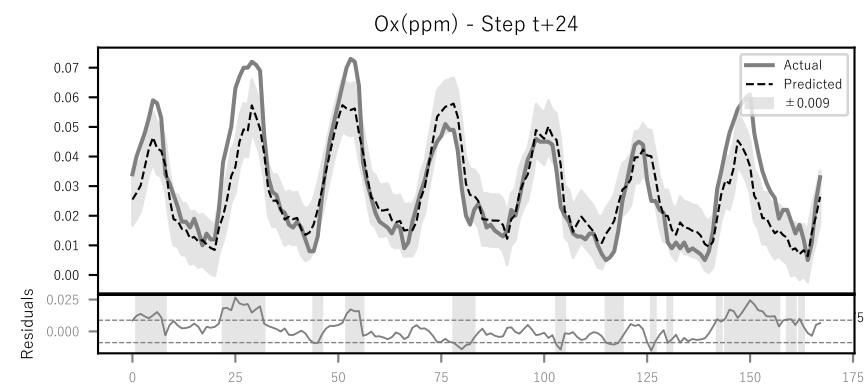
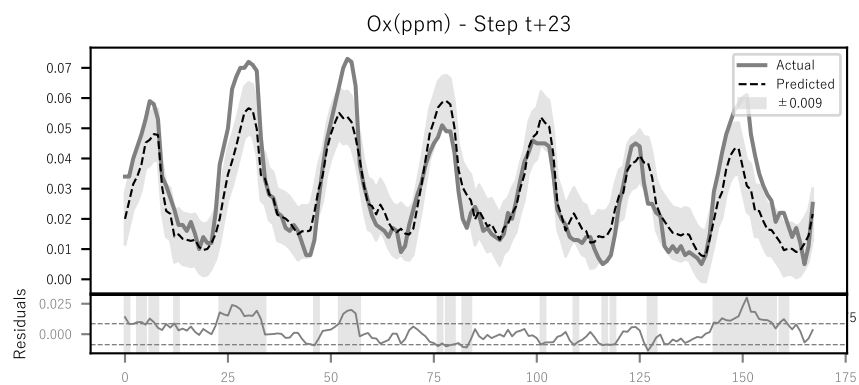
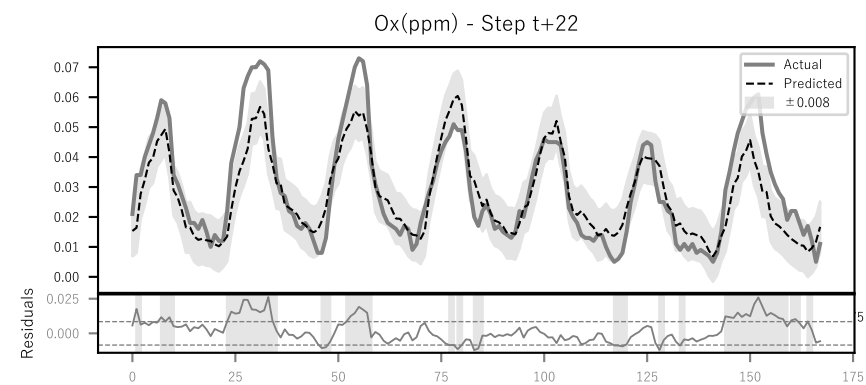
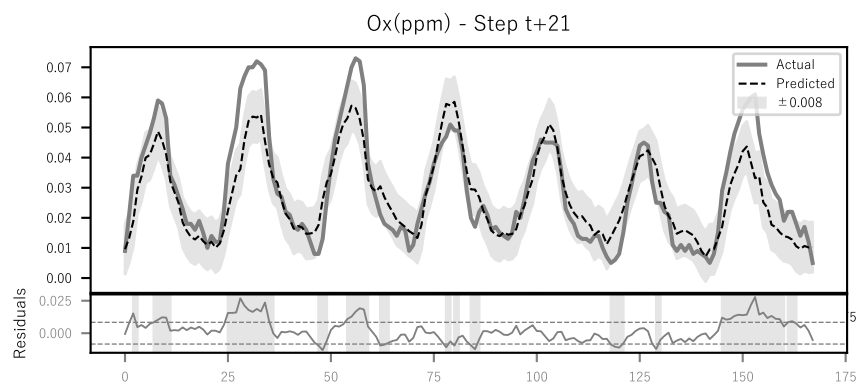
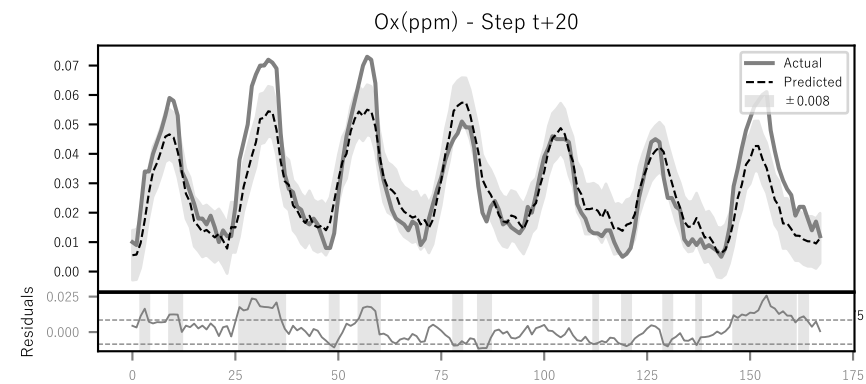
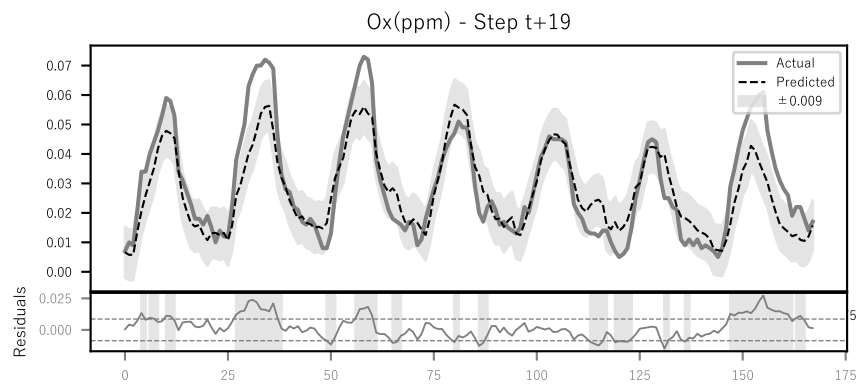
Comparison between actual and predicted values  
with  $\pm$  Standard Deviation Bands



Comparison between actual and predicted values  
with  $\pm$  Standard Deviation Bands



Comparison between actual and predicted values  
with  $\pm$  Standard Deviation Bands



MAE, RMSE, and R<sup>2</sup> for each Forecast Step

