東予 - オキシダント予測の分析

Model Parameters:
Prefecture code: 38
Station code: 38212040
Station name: 東予
Target item: Ox(ppm)
Number of data points in the train set: 13686
Number of data points in the test set: 5866
Forecast horizon (hours): 24
Number of used features: 141

Features:
 Ox(ppm), 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 - R²: 0.9467, MAE: 0.0026, RMSE: 0.0037
Ox(ppm)_t+02 - R²: 0.8783, MAE: 0.0040, RMSE: 0.0055
Ox(ppm)_t+03 - R²: 0.8214, MAE: 0.0050, RMSE: 0.0067
Ox(ppm)_t+04 - R²: 0.7669, MAE: 0.0058, RMSE: 0.0076
Ox(ppm)_t+05 - R²: 0.7179, MAE: 0.0064, RMSE: 0.0084
Ox(ppm)_t+06 - R²: 0.6663, MAE: 0.0070, RMSE: 0.0092
Ox(ppm)_t+07 - R²: 0.6311, MAE: 0.0073, RMSE: 0.0096
Ox(ppm)_t+08 - R²: 0.5989, MAE: 0.0076, RMSE: 0.0100
Ox(ppm)_t+09 - R²: 0.5788, MAE: 0.0078, RMSE: 0.0103
Ox(ppm)_t+10 - R²: 0.5592, MAE: 0.0080, RMSE: 0.0105
Ox(ppm)_t+11 - R²: 0.5416, MAE: 0.0082, RMSE: 0.0107
Ox(ppm)_t+12 - R²: 0.5237, MAE: 0.0083, RMSE: 0.0109
Ox(ppm)_t+13 - R²: 0.5091, MAE: 0.0085, RMSE: 0.0111
Ox(ppm)_t+14 - R²: 0.5019, MAE: 0.0085, RMSE: 0.0112
Ox(ppm)_t+15 - R²: 0.5034, MAE: 0.0085, RMSE: 0.0112
Ox(ppm)_t+16 - R²: 0.4984, MAE: 0.0085, RMSE: 0.0112
Ox(ppm)_t+17 - R²: 0.4876, MAE: 0.0087, RMSE: 0.0114
Ox(ppm)_t+18 - R²: 0.4747, MAE: 0.0088, RMSE: 0.0115
Ox(ppm)_t+19 - R²: 0.4638, MAE: 0.0089, RMSE: 0.0116
Ox(ppm)_t+20 - R²: 0.4658, MAE: 0.0089, RMSE: 0.0116
Ox(ppm)_t+21 - R²: 0.4569, MAE: 0.0089, RMSE: 0.0117
Ox(ppm)_t+22 - R²: 0.4603, MAE: 0.0089, RMSE: 0.0117
Ox(ppm)_t+23 - R²: 0.4577, MAE: 0.0089, RMSE: 0.0117
Ox(ppm)_t+24 - R²: 0.4472, MAE: 0.0090, RMSE: 0.0118

Comparison between actual and predicted values
with ± Standard Deviation Bands
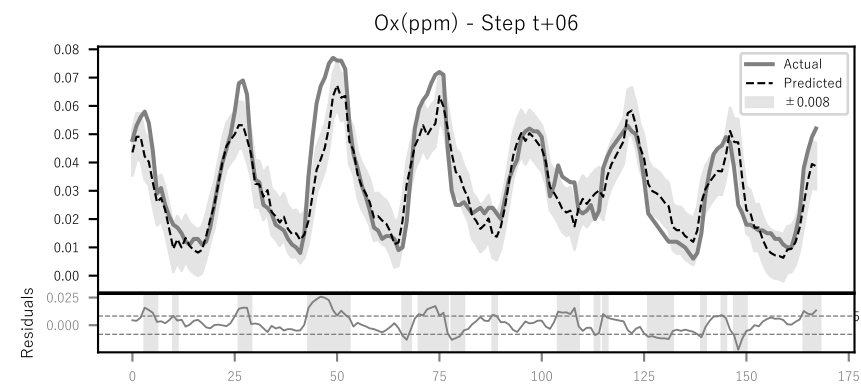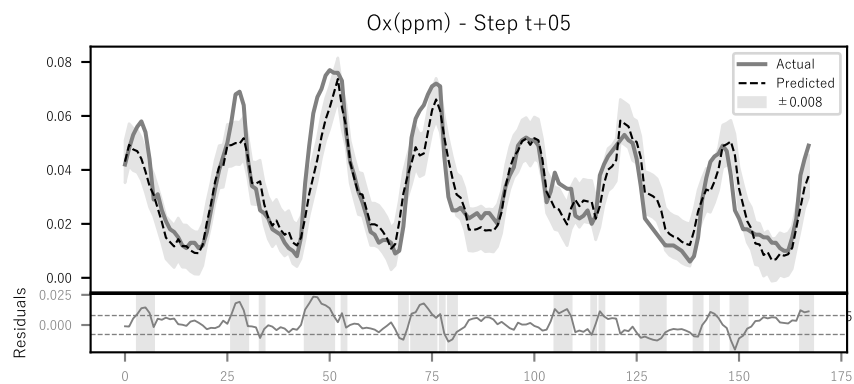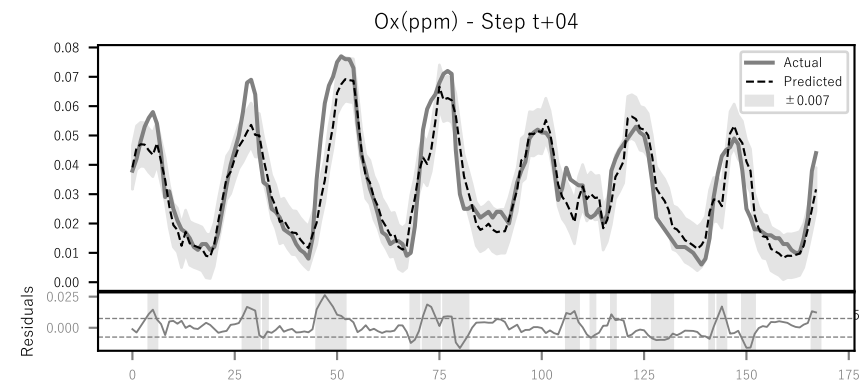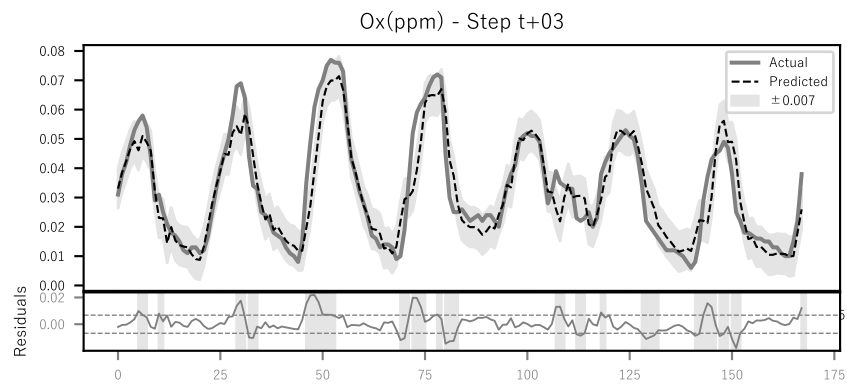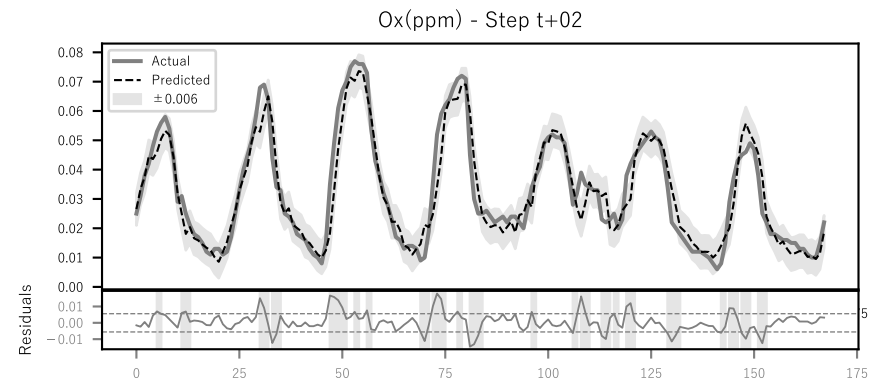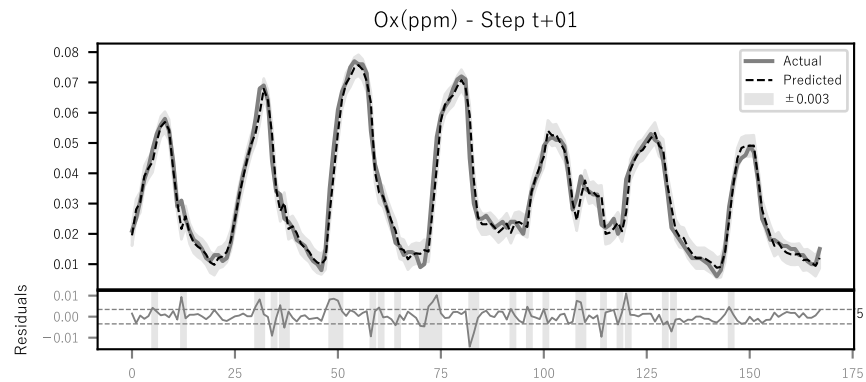
Comparison between actual and predicted values
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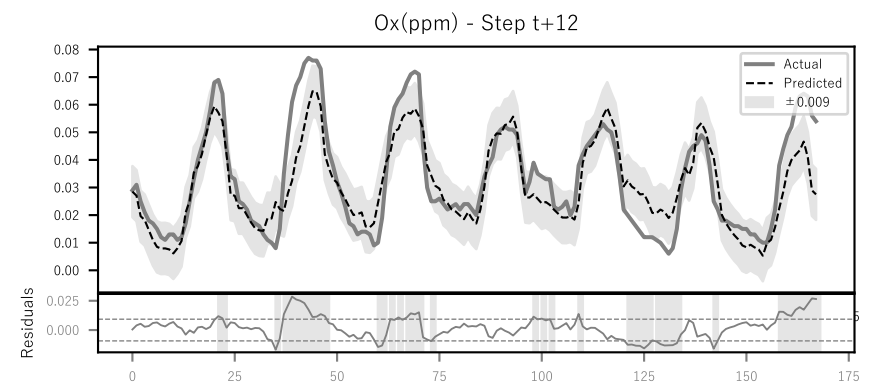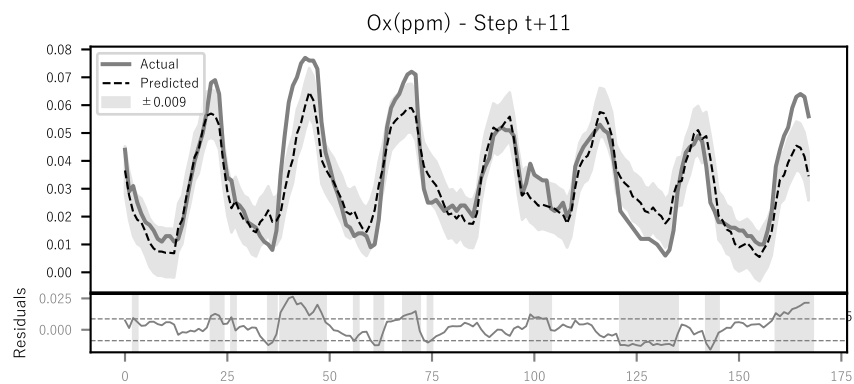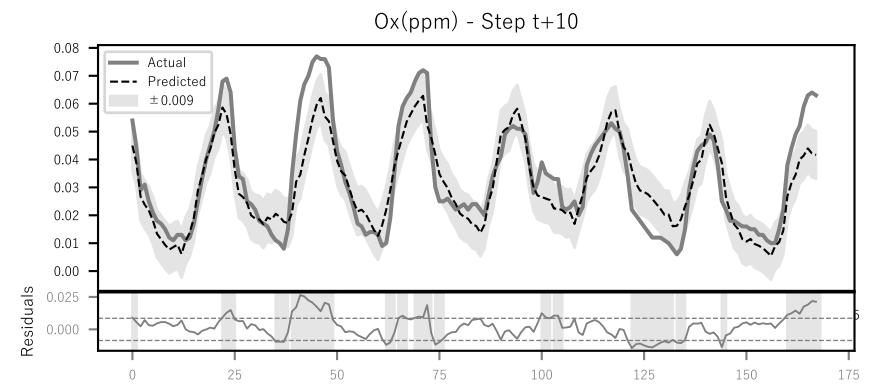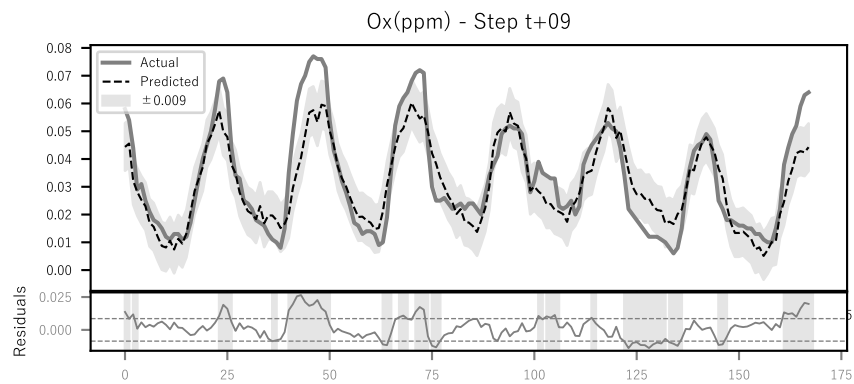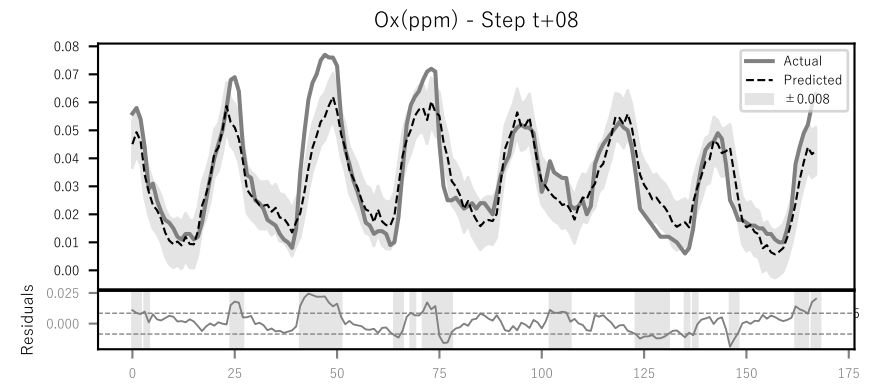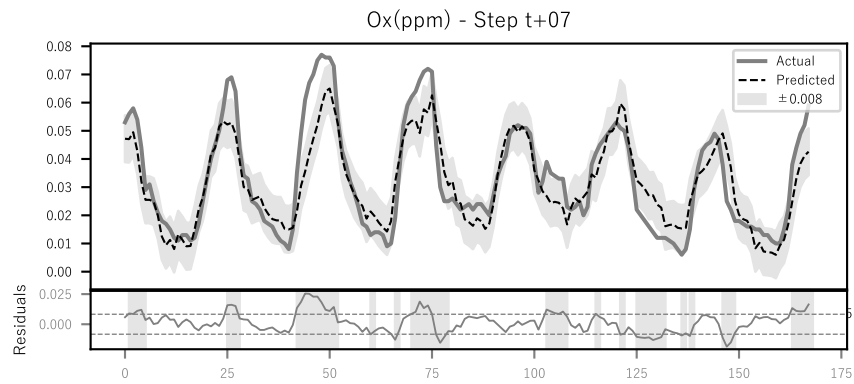
Comparison between actual and predicted values
with ± Standard Deviation Bands
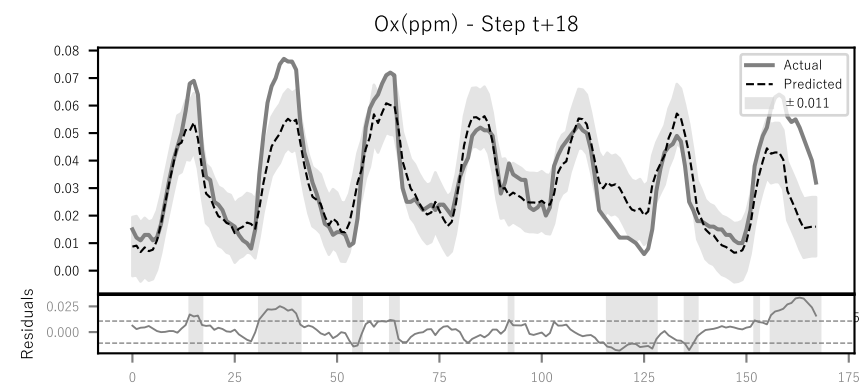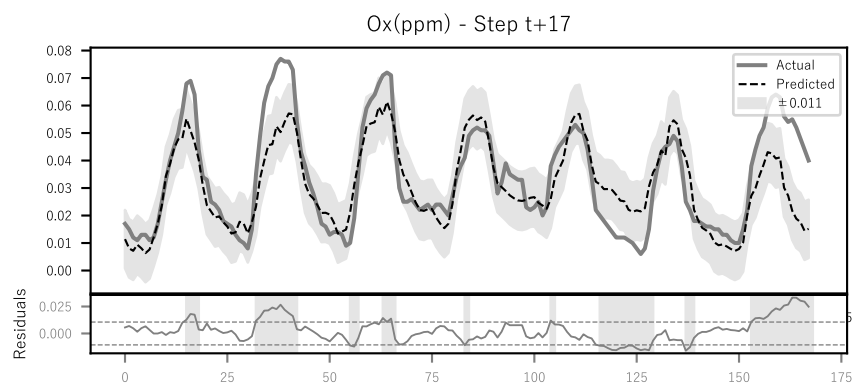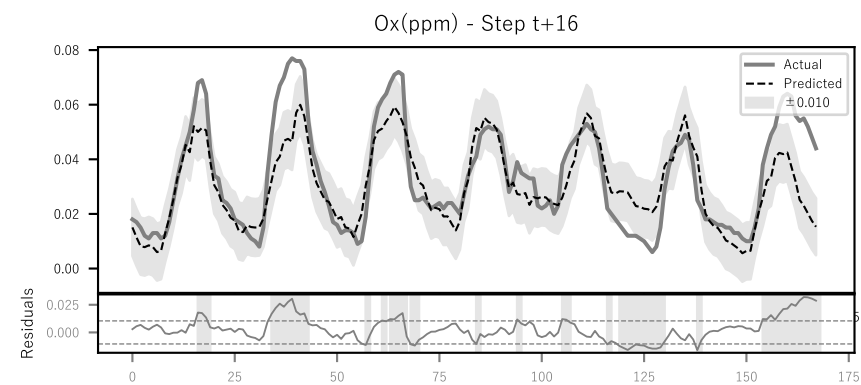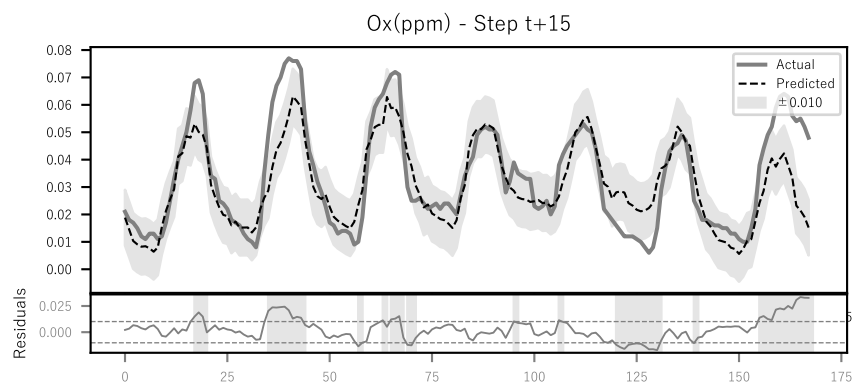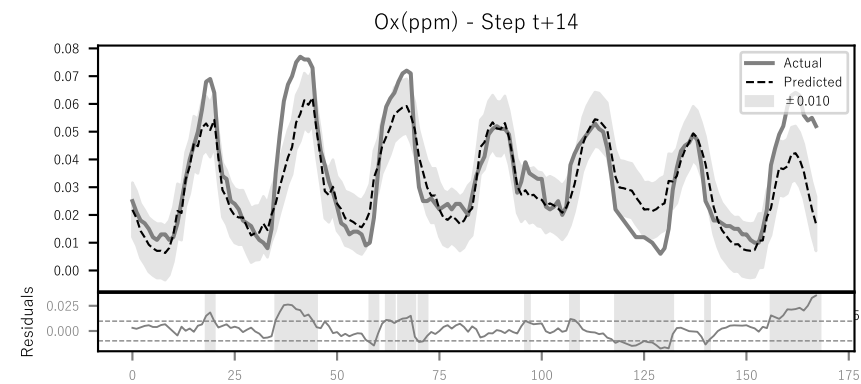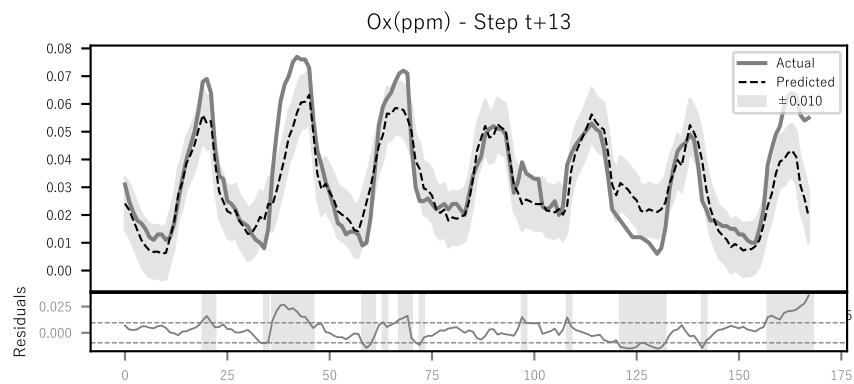
Comparison between actual and predicted values
with ± Standard Deviation Bands

MAE, RMSE, and R² for each Forecast Step

Normalized Feature Importance (per feature)

Feature	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	t+14	t+15	t+16	t+17	t+18	t+19	t+20	t+21	t+22	t+23	t+24
Ox(ppm)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.77	0.67	0.63	0.42	0.52	0.55	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.34
V_roll_std_6	0.13	0.20	0.13	0.15	0.30	0.35	0.33	0.18	0.79	1.00	0.92	1.00	0.91	1.00	0.64	0.68	0.56	0.65	0.76	0.52	0.69	0.87	0.80	0.48
dayofweek	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.27	0.39	0.78	1.00	0.80	1.00	0.97	0.99	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.98	1.00
NO2(ppm)_roll_std_6	0.11	0.21	0.16	0.18	0.11	0.13	0.07	0.03	0.31	0.85	0.83	0.84	0.91	1.00	1.00	0.88	0.88	0.94	0.78	0.81	0.68	0.43	0.53	0.38
U_roll_std_6	0.08	0.09	0.15	0.08	0.06	0.08	0.14	0.13	0.48	0.77	0.60	0.73	0.81	0.62	0.71	0.78	0.64	0.57	0.73	0.60	0.80	1.00	1.00	0.80
Ox(ppm)_roll_std_6	0.11	0.18	0.26	0.15	0.09	0.08	0.07	0.06	0.22	0.81	0.74	0.66	0.85	0.90	0.80	0.77	0.65	0.49	0.70	0.51	0.35	0.42	0.39	0.37
hour_sin	0.06	0.17	0.34	0.50	0.69	0.89	0.93	0.64	0.74	0.71	0.47	0.40	0.69	0.12	0.00	0.00	0.00	0.31	0.29	0.08	0.08	0.33	0.45	0.21
NO2(ppm)_roll_mean_3	0.05	0.08	0.08	0.05	0.00	0.04	0.00	0.06	0.26	0.63	0.61	0.58	0.75	0.39	0.59	0.71	0.45	0.40	0.58	0.51	0.14	0.24	0.08	0.00
U_roll_mean_3	0.12	0.17	0.21	0.08	0.12	0.15	0.20	0.00	0.00	0.35	0.10	0.00	0.30	0.13	0.45	0.45	0.41	0.25	0.09	0.35	0.05	0.36	0.18	0.06
V_roll_mean_3	0.17	0.20	0.17	0.18	0.24	0.10	0.00	0.06	0.17	0.00	0.00	0.01	0.00	0.00	0.36	0.47	0.14	0.09	0.09	0.17	0.13	0.34	0.30	0.06

Forecast Step (columns labelled Ox(ppm)_t+01 … Ox(ppm)_t+24)

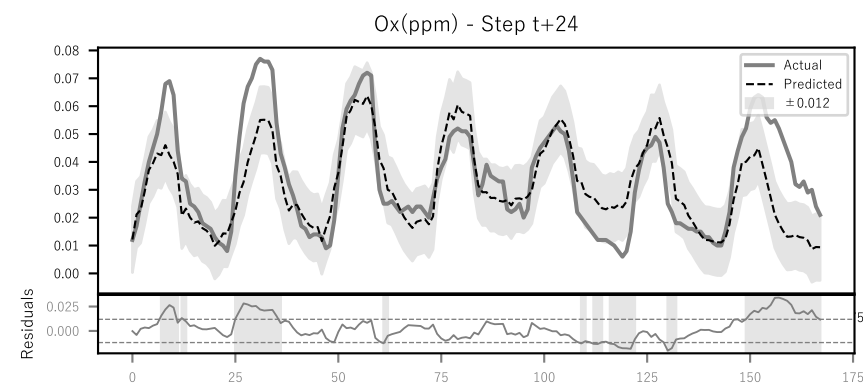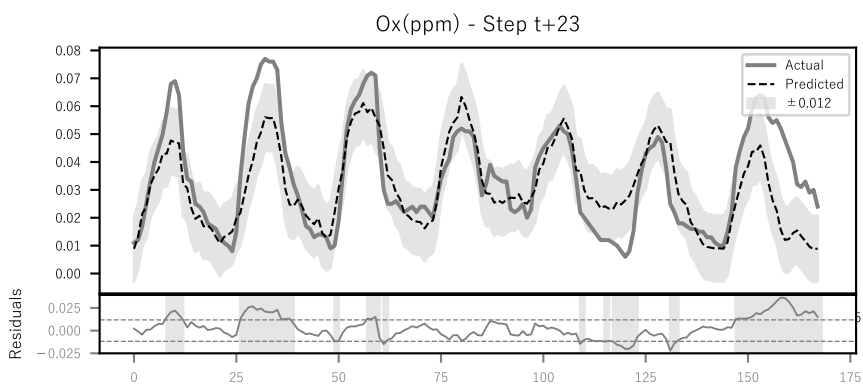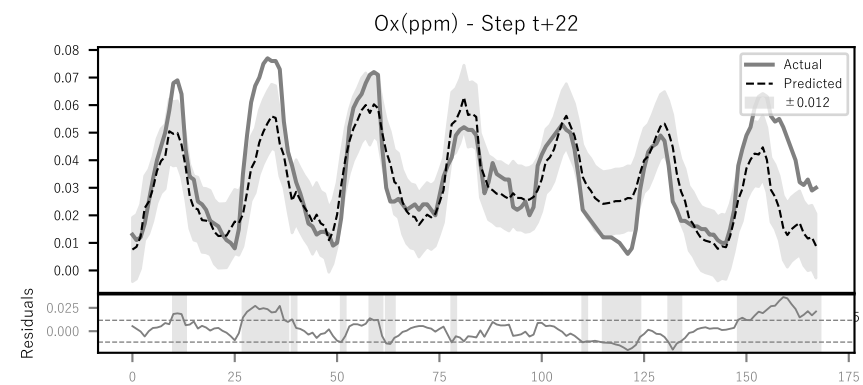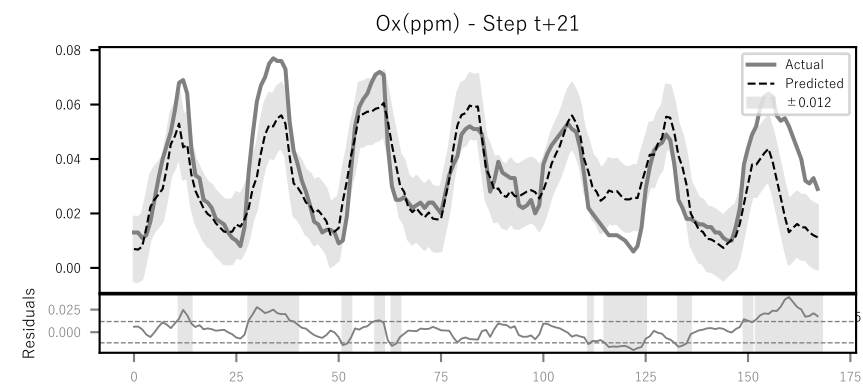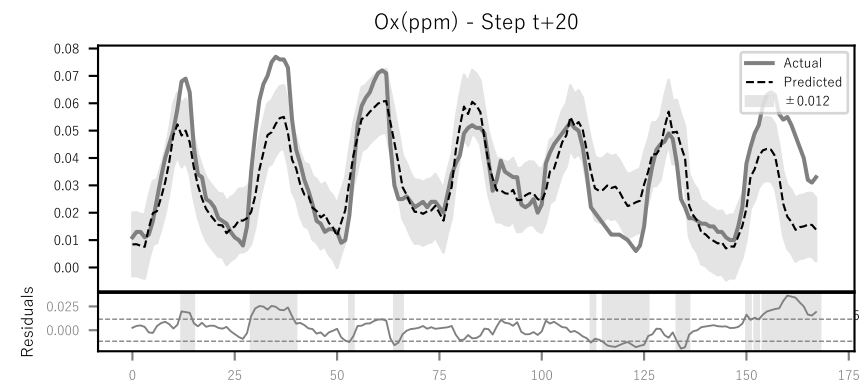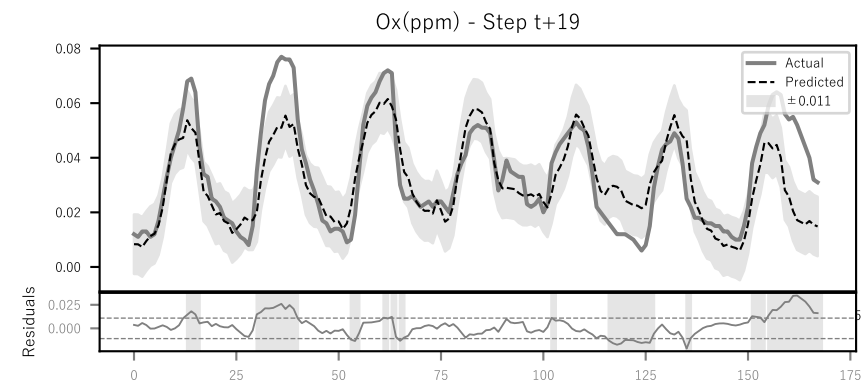## Normalized Feature Importance (per step)

Feature	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	t+14	t+15	t+16	t+17	t+18	t+19	t+20	t+21	t+22	t+23	t+24
Ox(ppm)	1.00	0.80	0.69	0.68	0.55	0.51	0.47	0.42	0.30	0.20	0.23	0.21	0.19	0.16	0.14	0.13	0.06	0.05	0.05	0.04	0.06	0.00	0.03	0.16
V_roll_std_6	0.00	0.21	0.10	0.27	0.62	0.75	0.74	0.46	0.82	0.75	0.86	0.97	0.82	0.94	0.52	0.52	0.52	0.68	0.68	0.48	0.77	1.00	0.93	0.60
dayofweek	0.00	0.04	0.17	0.24	0.32	0.39	0.45	0.64	0.58	0.65	0.83	0.74	0.82	0.82	0.96	0.94	0.95	0.92	0.82	0.89	0.94	0.89	0.97	1.00
NO2(ppm)_roll_std_6	0.00	0.26	0.22	0.35	0.22	0.34	0.33	0.27	0.38	0.57	0.68	0.71	0.71	0.81	1.00	0.78	0.83	0.87	0.62	0.70	0.66	0.34	0.50	0.44
U_roll_std_6	0.00	0.02	0.27	0.20	0.22	0.34	0.47	0.43	0.54	0.56	0.56	0.64	0.66	0.57	0.61	0.66	0.60	0.56	0.61	0.56	0.78	0.98	1.00	0.85
Ox(ppm)_roll_std_6	0.00	0.24	0.62	0.40	0.29	0.38	0.47	0.43	0.45	0.74	0.84	0.77	0.90	1.00	0.96	0.84	0.79	0.63	0.76	0.60	0.50	0.45	0.50	0.58
hour_sin	0.17	0.34	0.59	0.81	0.89	1.00	0.97	0.73	0.62	0.52	0.49	0.45	0.54	0.36	0.04	0.00	0.19	0.42	0.39	0.30	0.33	0.38	0.48	0.41
NO2(ppm)_roll_mean_3	0.00	0.12	0.29	0.35	0.32	0.54	0.58	0.65	0.70	0.82	0.93	0.90	1.00	0.73	0.77	0.93	0.71	0.74	0.85	0.82	0.49	0.41	0.29	0.35
U_roll_mean_3	0.00	0.22	0.64	0.21	0.46	0.73	1.00	0.45	0.30	0.53	0.33	0.03	0.40	0.33	0.37	0.23	0.60	0.42	0.10	0.56	0.13	0.47	0.20	0.19
V_roll_mean_3	0.49	0.55	0.53	0.80	1.00	0.68	0.59	0.70	0.65	0.21	0.30	0.18	0.00	0.25	0.22	0.43	0.08	0.22	0.24	0.34	0.41	0.53	0.59	0.33

Target (columns labelled Ox(ppm)_t+01 … Ox(ppm)_t+24)