LGBM Parameter Selection Report - 西条

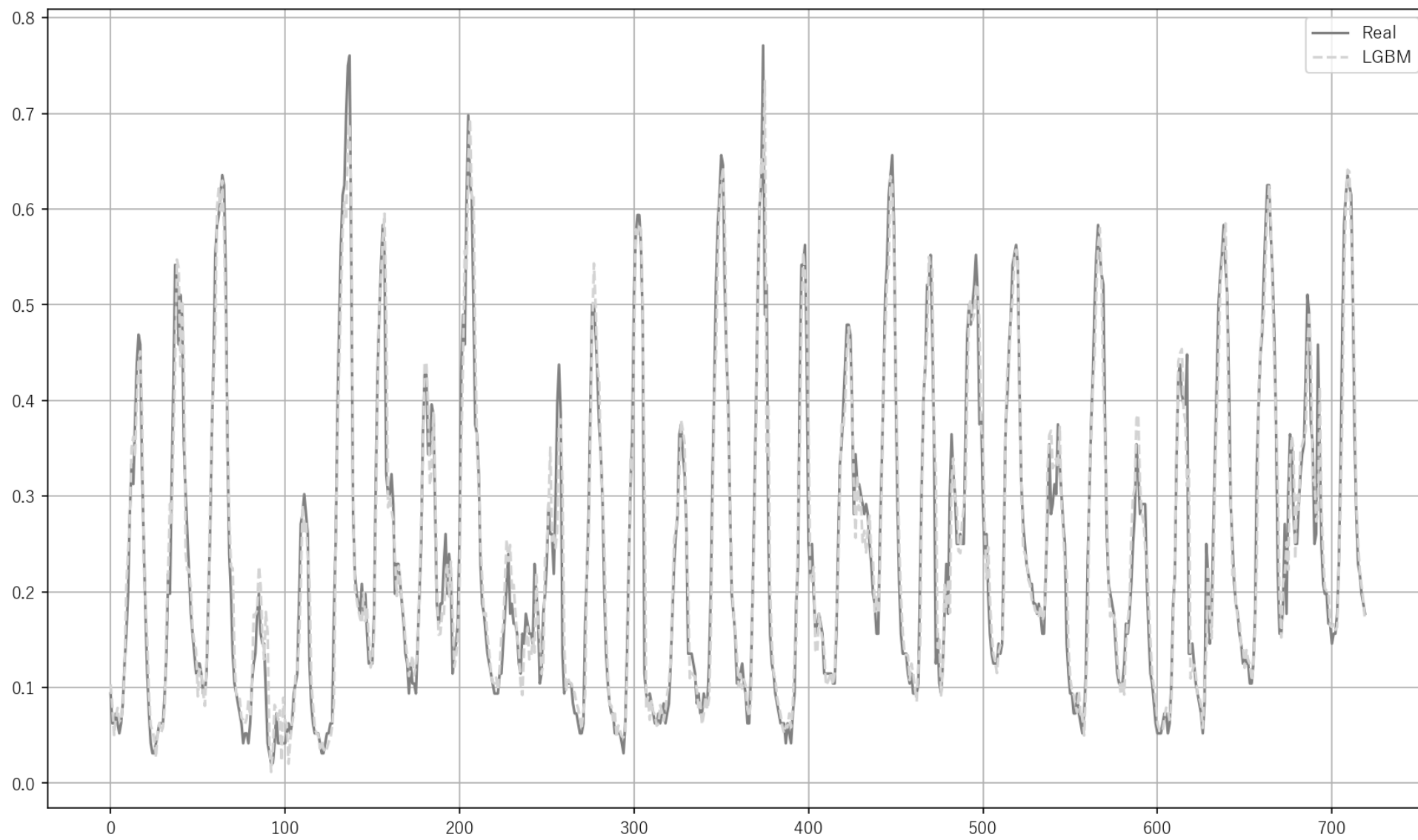|	
Prefecture code	38
Station code	38206050
Station name	西条
Target item	Ox(ppm)
Model	LGBMRegressor
Number of features used	140
Train samples	18002
Validation samples	4501
Parameter Grid n_estimators	[450]
Parameter Grid max_depth	[12, 15]
Parameter Grid num_leaves	[32, 33]
Parameter Grid learning_rate	[0.04, 0.05]
Parameter Grid min_child_samples	[6, 7]
Parameter Grid subsample	[0.01]
Parameter Grid colsample_bytree	[1.0]
Best Parameter colsample_bytree	1.0
Best Parameter learning_rate	0.05
Best Parameter max_depth	12
Best Parameter min_child_samples	6
Best Parameter n_estimators	450
Best Parameter num_leaves	32
Best Parameter subsample	0.01
R²	0.9551895223458083
MAE	0.031088816016286866
RMSE	0.044928399356143595
Residuals Prob(Q)	5.77113603230465e-12
Residuals skew	-0.159
Residuals kurtosis	4.139

Features used for prediction

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

Model accuracy

Target	R^2	MAE	RMSE
Ox(ppm)	0.9552	0.0311	0.0449

LGBM Regression
R²: 0.95519

Residual Errors
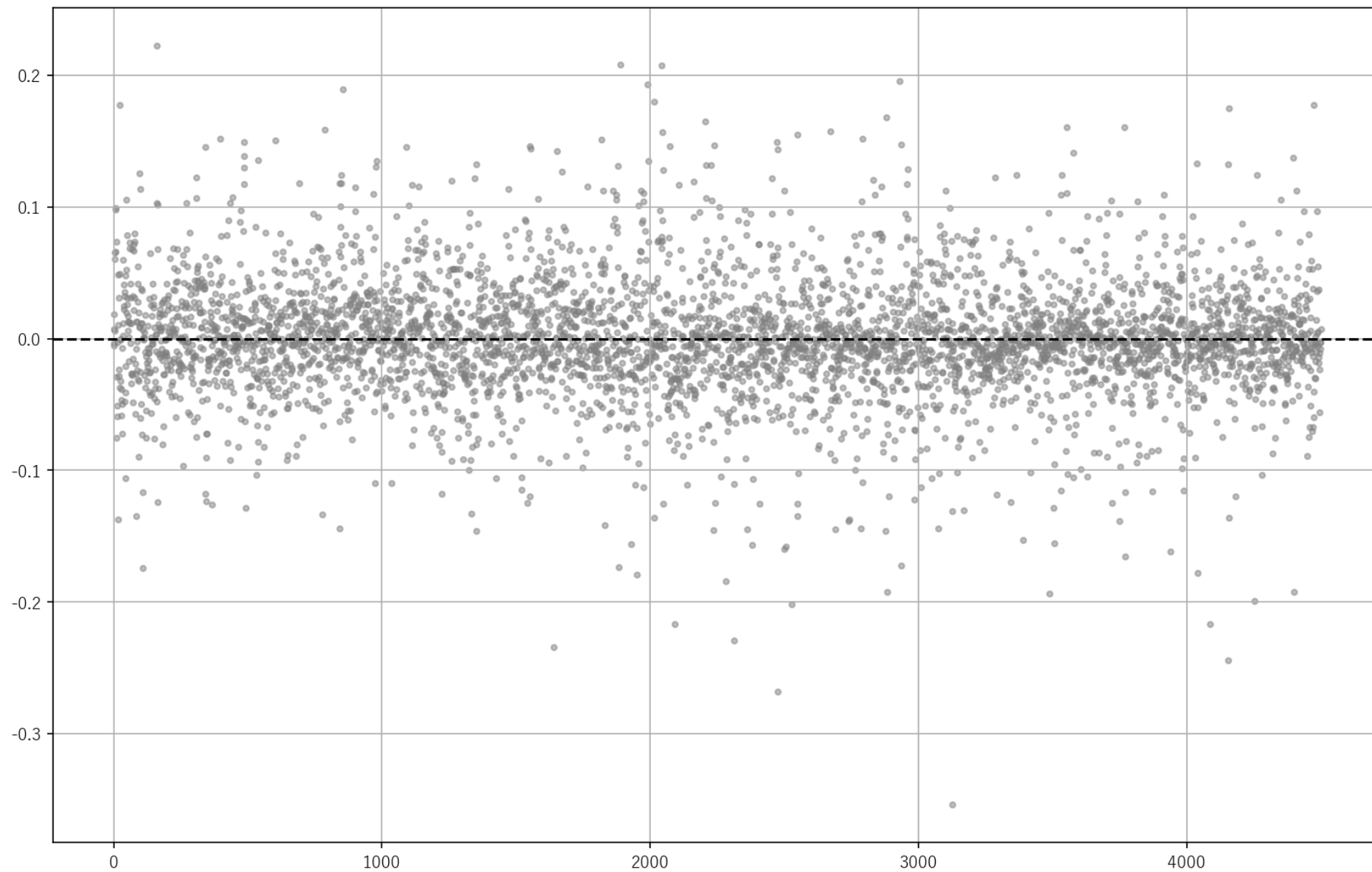
Residuals Distribution

Mean=0.00006
Median=-0.00131
Mode=-0.00242
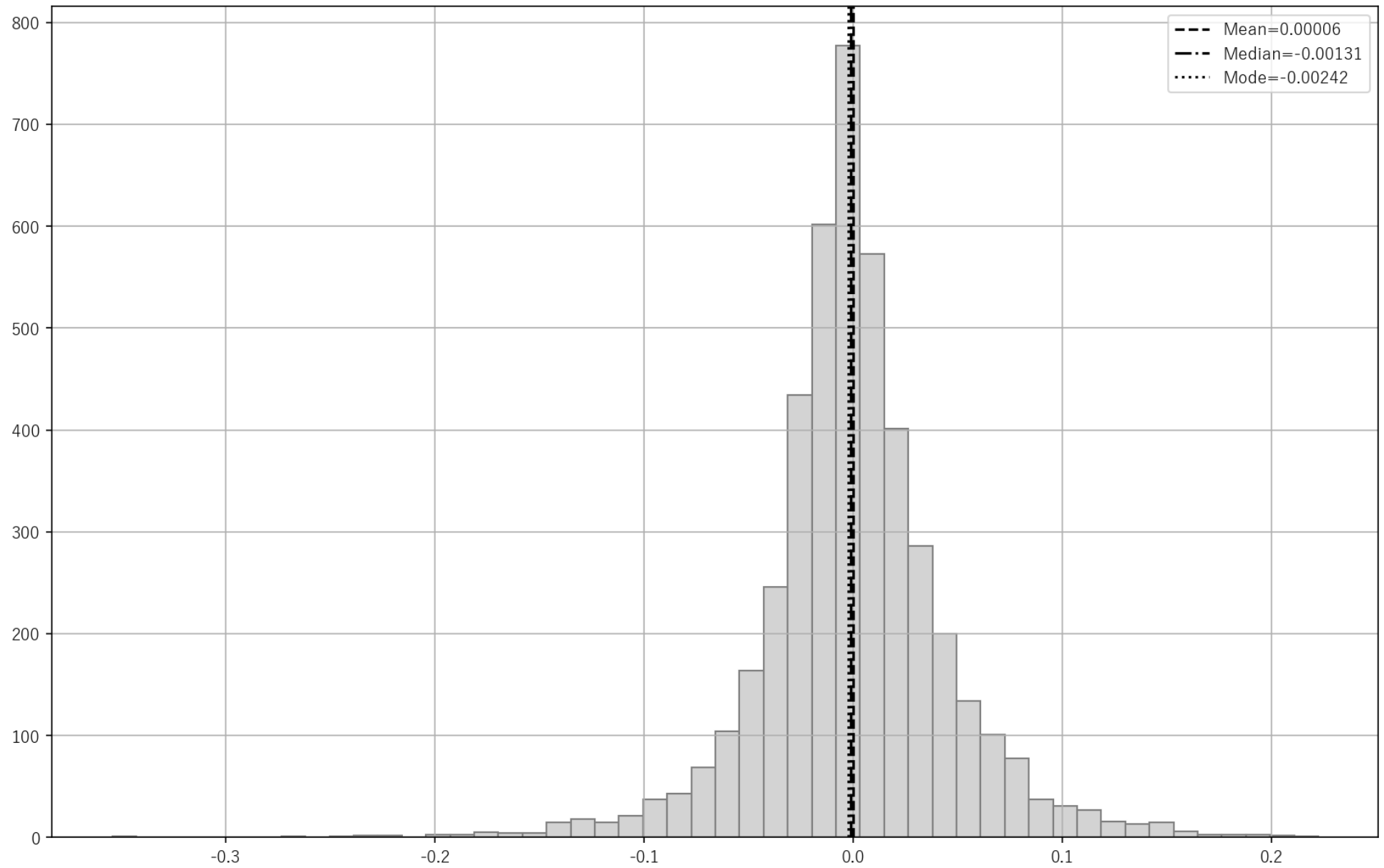
Top 20 Feature Importances (LGBM)

Feature	Importance
Ox(ppm)_lag1	733.000
NO2(ppm)	624.000
NO2(ppm)_lag1	498.000
U	409.000
V	396.000
Ox(ppm)_diff_1	366.000
NO(ppm)	271.000
hour_cos	243.000
V_lag1	238.000
V_lag2	209.000
NO(ppm)_lag1	202.000
U_lag2	197.000
V_roll_mean_3	180.000
Ox(ppm)_roll_std_6	163.000
V_diff_3	155.000
U_lag1	149.000
Ox(ppm)_diff_2	147.000
U_roll_std_6	146.000
U_lag3	138.000
Ox(ppm)_diff_3	131.000