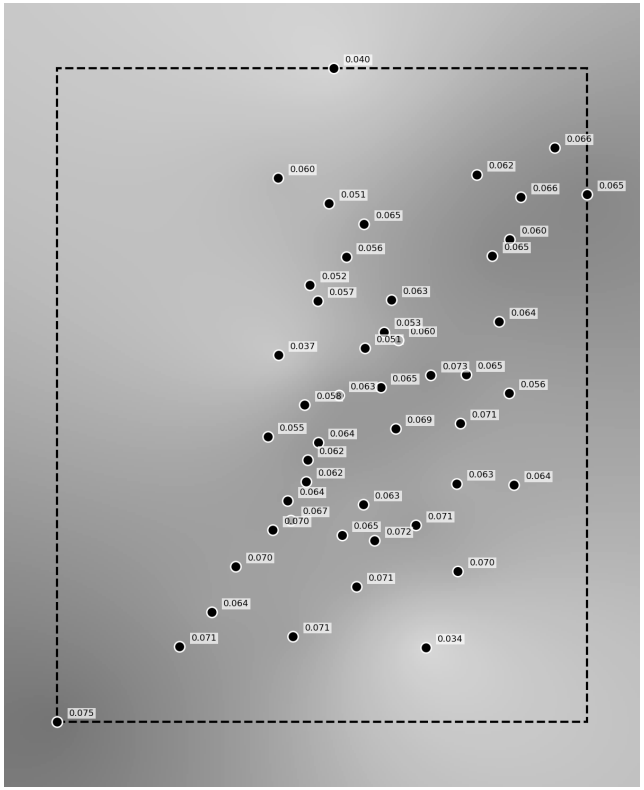
LightGBM Interpolation and residuals Kriging - 2025/5/12 19H

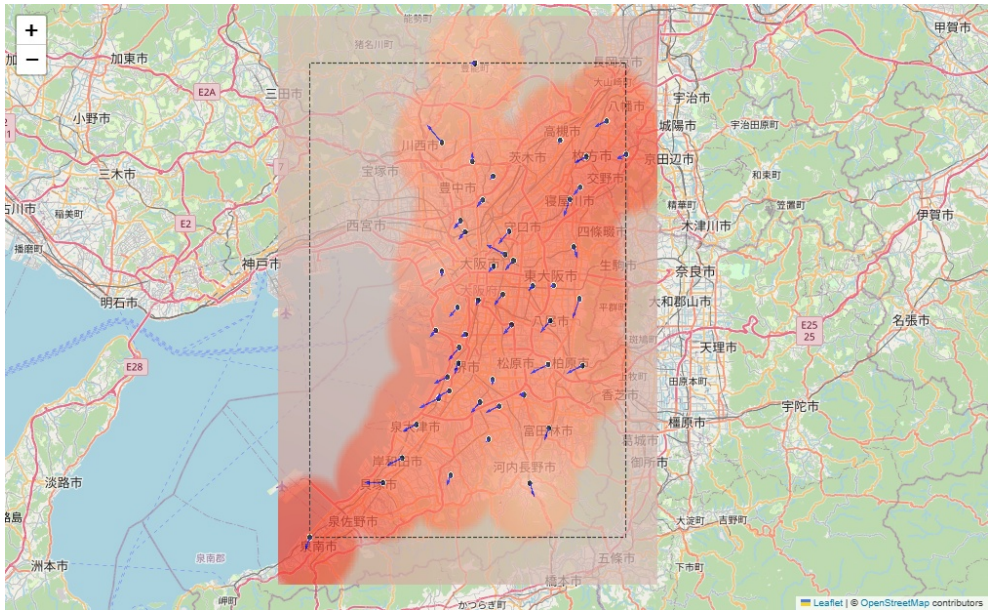
$$\hat{y}(x) = f_{\mathrm{LGBM}}(x) + r_{\mathrm{Kriging}}(x)$$

$\hat{y}(x)$: final predicted value at location x (e.g., Ox concentration)
$f_{\mathrm{LGBM}}(x)$: prediction from the LightGBM model at x
$r_{\mathrm{Kriging}}(x)$: interpolated residual at x using Ordinary Kriging

Step 1: Train LightGBM with LOOCV and compute residuals
Step 2: Fit Ordinary Kriging on residuals from training stations
Step 3: Predict on a spatial grid and combine the two terms

Kriging captures spatial patterns not learned by LightGBM.





RMSE	MAE	R²
0.00468	0.00314	0.589