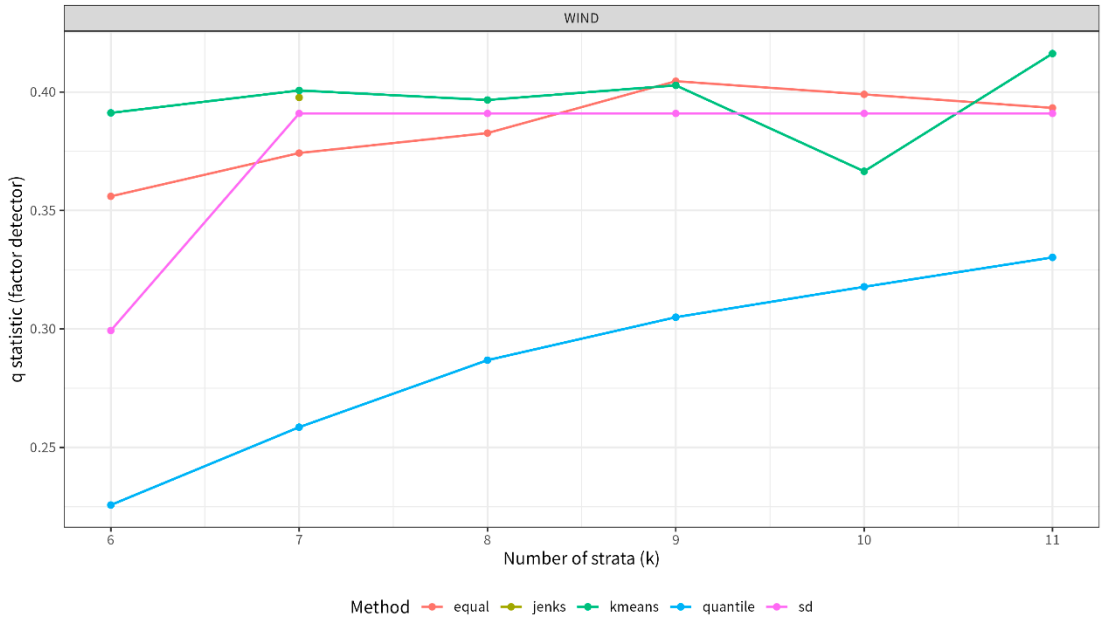
This Supplementary Material details the GeoDetector classification sensitivity test to confirm the optimal scheme for factor and interaction detection. Five classification methods (equal, jenks, kmeans, quantile, sd) and 6–11 categories were tested, focusing on four pollutant datasets for $PM_{2.5}$ (annual/summer average) and O_3 (annual/winter average). Driving factors included meteorological and topographic data, consistent with the main text. After preprocessing, 30 classification schemes per driving factor were used for detection calculations. Results (q-statistics, interaction q-values) were sorted into four folders (results1–4), corresponding to the four pollutant datasets respectively. Using mean q-statistic (higher is better) and CV (lower is better) as criteria, the optimal scheme was determined. Detailed results are available in the folders, supporting the main text's classification rationality.

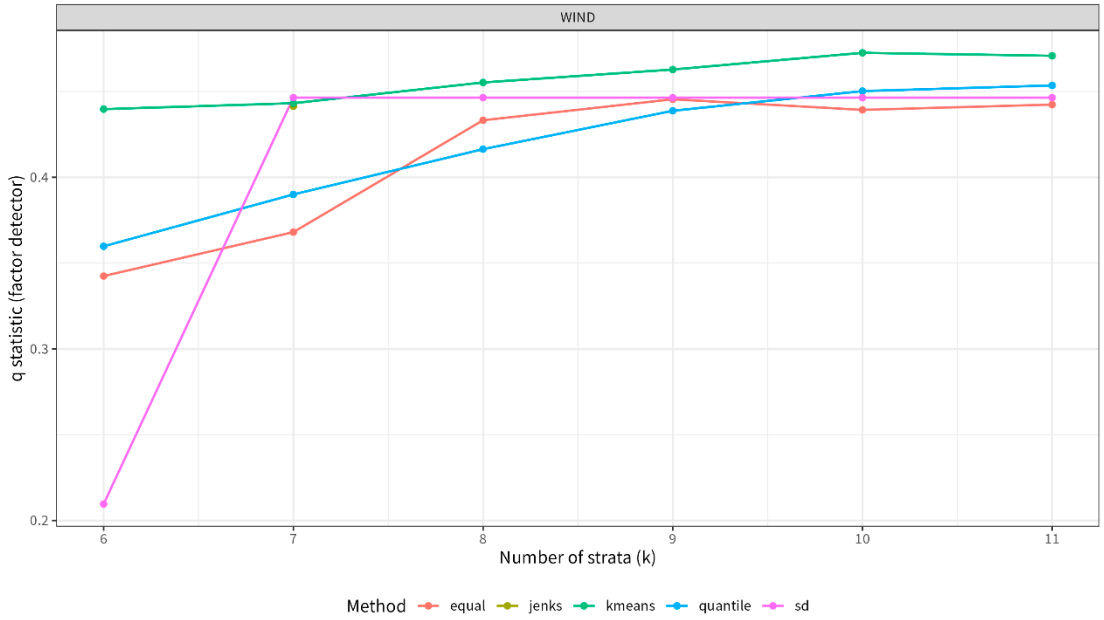
Some figures are shown as follows.

Figure S1. Sensitivity of factor detector results to discretization method and number of strata.

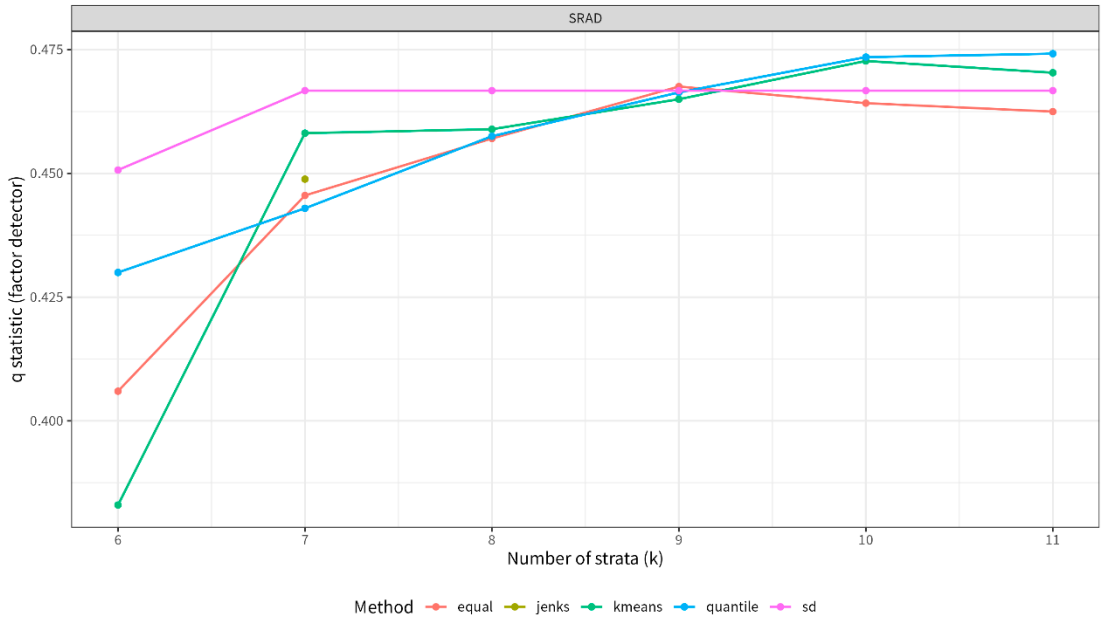
$PM_{2.5}$—annual (folder "results1"):



O_3—annual (folder “results2”):



O_3—summer (folder “results3”):



$PM_{2.5}$—winter (folder “results4”):

