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Variability of average daily ozone level in Ile de France and in 3 medium cities of west-central France (La Rochelle, Limoges and Clermont-Ferrand)

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Ozone levels of 14 measuring stations are used in the summer period (June 15 to September 15) from 1999 to 2004:
- 6 urban or suburban stations in Ile de France and one more in rural areas (forest of Rambouillet)
- 6 urban or suburban stations over the towns of La Rochelle, Limoges and Clermont-Ferrand, and one more in rural area (Puy de Dôme).
A PCA shows the strong spatial structuring of the data set. The first axis explained (75% of total variance of data (only two stations near the coast are less correlated with other stations). An axis 2 (10%) shows a secondary opposition between Ile de France and the 3 cities of central west of the country. A third axis explains only a part of variance of the two stations located near the Atlantic coast.
These PCA results are correlated with daily climatic parameters (cloud cover, surface air temperature, strength and wind direction) of 5 stations network of Météo-France (1 per town, 2 for Ile de France), that explain some of this variability.
The average rate of ozone is also linked, at all stations, on to the day of the week (which is especially evident in the difference between Weekdays and Sundays). At daily scale, the backward trajectory of air (NOAA Hysplit Model, duration 48 hrs) also provides complement additional explanation of differences between the Ile de France, the coastal town and two other towns (Limoges and Clermont-Ferrand).