



## **Study of atmospheric dynamics and pollution in the coastal area of English Channel using clustering technique**

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The problem of atmospheric contamination by principal air pollutants was considered in the industrialized coastal region of English Channel in Dunkirk influenced by north European metropolitan areas.

MESO-NH nested models were used for the simulation of the local atmospheric dynamics and the online calculation of Lagrangian backward trajectories with 15-minute temporal resolution and the horizontal resolution down to 500 m. The one-month mesoscale numerical simulation was coupled with local pollution measurements of volatile organic components, particulate matter, ozone, sulphur dioxide and nitrogen oxides.

Principal atmospheric pathways were determined by clustering technique applied to backward trajectories simulated. Six clusters were obtained which describe local atmospheric dynamics, four winds blowing through the English Channel, one coming from the south, and the biggest cluster with small wind speeds. This last cluster includes mostly sea breeze events.

The analysis of meteorological data and pollution measurements allows relating the principal atmospheric pathways with local air contamination events. It was shown that contamination events are mostly connected with a channelling of pollution from local sources and low-turbulent states of the local atmosphere.