

SUMMIT RESEARCH

Non-exhaust emissions from motor vehicles

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Traffic-related emissions: what are the most recent developments?

- Cleaner technologies for vehicle engines (**exhaust emissions**)
- Electric vehicles with zero exhaust emissions
- Broad scientific evidence available on non-exhaust emissions (**tyre-wear, brake-wear** and **road-wear** emissions)
- Inventories for emission sources with chemical profiles



What is missing ?

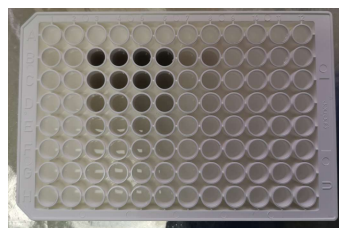


Research objectives and methodologies

- ❖ Identification of chemical **emission profiles and chemical tracers** for non-exhaust emission sources;
- ❖ Identification of physico-chemical characteristics of specific NEE species with **potential health effects**
- ❖ Update of **emission inventories**, review of environmental standards and support to air quality plans



Literature review on the available **sampling methodologies**



Sampling campaigns in various Portuguese locations in different **road environments**.

Collection of **road dust** (PM₁₀ fraction) with specific instruments and subsequent laboratory processing for **chemical characterisation** and **ecotox**:

- Carbonaceous content (OC, EC)
- Metals and metalloids
- Organics compounds (PAHs)
- Toxicological assay on bacteria *Vibrio F.*

Research outcomes and achieved results

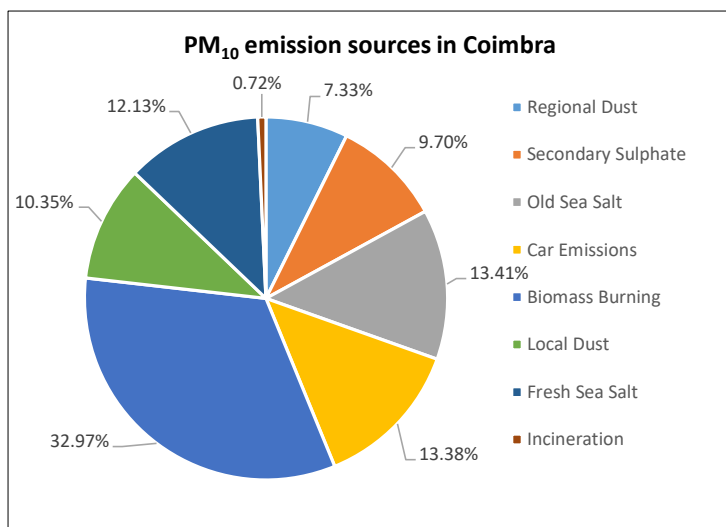


Figure 1. Source apportionment of urban PM₁₀ with PMF software.

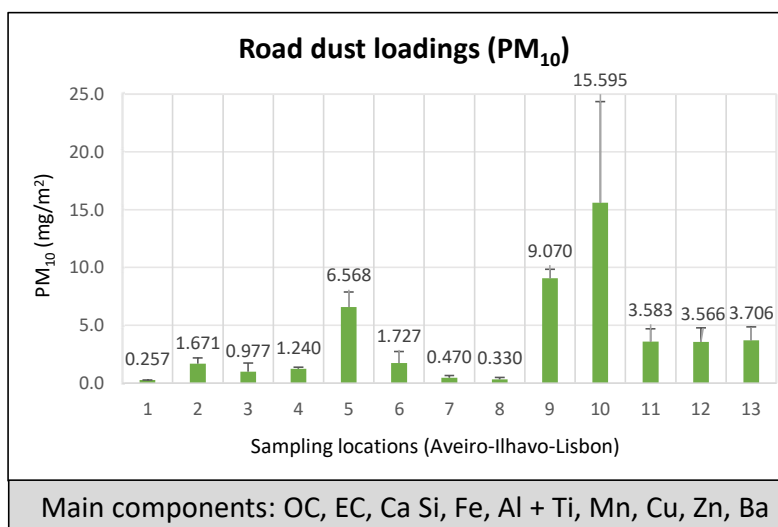


Figure 2. Road dust loadings in various road environments (roads, roundabouts, tunnels) and different pavement types.

Scientific dissemination:

Articles:

1) I. Casotti Rienda, C.A. Alves. **Road dust resuspension: a review.** (2021-under review)

2) I. Casotti Rienda, C. Pio, T. Nunes, C. Gonçalves, O. Tchepel, N. K. Pina, J. Rodrigues, F. Lucarelli, C. A. Alves **Identification of sources of particulate matter of a medium-size Western-Iberian city** (in preparation).

Other communications (conference abstracts):

1) I. Casotti Rienda, C. Pio, T. Nunes, C. Gonçalves, O. Tchepel, N. Pina, F. Lucarelli, S. Nava, G. Calzolari and C.A. Alves. **Source apportionment of particulate matter of a medium-size Western-Iberian city.** (EAC 2021).

2) I. Casotti Rienda, T. Nunes, C. Gonçalves, F. Lucarelli, S. Nava, G. Calzolari, F. Amato and C.A. Alves. **Road dust resuspension in a coastal region: PM₁₀ emission factors and chemical profiles.** (EAC 2021).

ACKNOWLEDGMENTS

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