

PhD student:

Xuan-Trinh TRUONG

Title:

Characterization and assessment of particles resulting from pavement-tyre interaction and their impacts on human health and the environment

Abstract

The project concerns the physico-chemical and (eco) toxicological characterization of TRWP (Tire-Road Wear Particles) aerosols, particles generated by tire friction on roads. The objective of this thesis is to strengthen scientific knowledge on the nature of particles emitted at the tyre-road interface through on-board measurements (on the road and on a test track) according to different parameters having a strong influence.

The measurement strategy developed should allow to:

1. dissociate the particles generated by the tyre-road contact from those resulting from the ambient background;
2. probe the link between the size distribution, the chemical nature (mineral/organic matter ratio, etc.) of the TRWPs emitted and the various parameters governing the emission dynamics;
3. evaluate the toxicological impact of emissions.

Given the technical complexity of the subject, we propose to limit this project to a single fixed tyre/passenger vehicle pair, passenger vehicles being the largest contributors to TRWP emissions. Numerous studies have already been carried out, notably within the framework of the World Business Council for Sustainable Development (WBCSD) Tyre Industry Project (TIP), but they are still insufficient to assess the total risk.