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## About EASVOLEE

EASVOLEE is a research project focused on assessing the impact of semi-volatile engine emissions on air quality in Europe. The project aims to quantify the role of secondary aerosol formation from transport engines in air pollution. It also seeks to

develop health-related metrics, mitigation strategies, and policies to reduce aerosol concentrations, including organic, inorganic, and nanoparticle aerosols. The project is a collaboration among 8 partners from 6 countries, including FORTH,

CNRS, TNO, Weizmann, MET.Norway, CRMT, PSI, and BFH. The goal is to improve air quality by limiting vehicle exhaust emissions. EASVOLEE, launched in February 2023, is funded under the EU Horizon Europe Research and Innovation Action (GA-101095457).

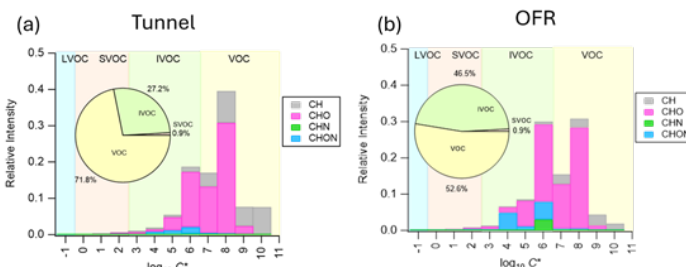
## Vehicle emissions measurement campaign in the Fréjus tunnel

Detailed measurements were conducted in the Fréjus tunnel (between France and Italy) during a three-week period in May and June 2024. The PSI oxidation flow reactor (OFR) was deployed in the tunnel to study the formation of secondary organic aerosol (SOA) from the emissions of cars and trucks.

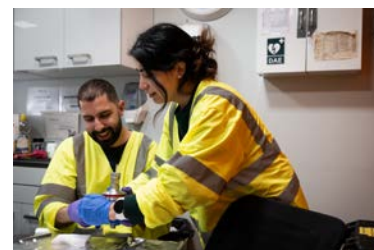
A comprehensive investigation was conducted into the potential for SOA formation from both daytime and nighttime chemical processes in the Fréjus tunnel. The VOC composition and volatility in the tunnel and OFR were

analyzed to elucidate the evolution of SOA. Molecular-level characterization of SOA composition was also performed, and the effective emission factors of SOA in the tunnel were quantified and compared with test bench measurements conducted in Biel. Our results highlight the importance of daytime oxidation in SOA formation from vehicle emissions, while the impact of nighttime chemical reactions was found to be of secondary importance. We also observed a significant gap in the effective emission factors of SOA between field measurements and laboratory dynamometer test results. These

EASVOLEE findings offer valuable insights into the contribution of tailpipe organic gases from real-world traffic to atmospheric SOA.



**Figure 1.** Comparisons of VOC volatility distribution as a function of binned saturation vapor concentration from: (a) tunnel air and (b) after the OFR. The VOC composition is coloured by chemical families.



**Figure 2.** PSI, TNO and FORTH teams work together towards characterizing harmful transport emissions.



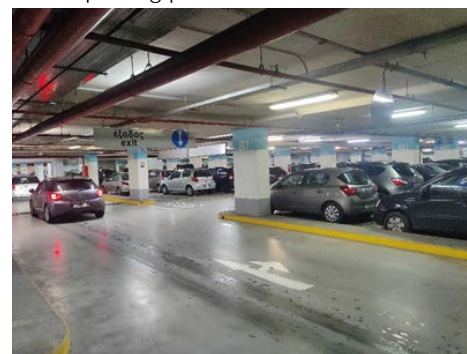
EASVOLEE has received funding from the European Union's Horizon Europe (2021-2027) research and innovation programme under grant agreement No 101095457.

*"EASVOLEE will allow, for the first time, the simulation and monitoring, under real driving conditions, of the potential aerosol formation induced by the vehicle emissions"*

## Vehicle emissions measurements in an indoor parking facility in Patras

The major focus of that campaign was on the role of cold start emissions as sources of both volatile (VOCs) and intermediate volatility organic compounds (IVOCs) that produce secondary organic aerosol (SOA) as they react in the atmosphere. The study was conducted in a large indoor parking facility in Patras, Greece (Figure 3), providing a relatively controlled environment to examine emissions produced when vehicles start and leave the structure. These conditions offered an opportunity to observe real-world emissions of thousands of vehicles, while minimizing external environmental influences like mixing, wind, etc. During the month-long study more than 20,000 vehicles started and left the parking structure. The mobile laboratory from FORTH was moved into the parking structure to enable emission characterization and secondary aerosol formation experiments. The PSI oxidation flow reactor (OFR) was used as the primary tool to oxidize the emissions, simulating daytime but also nighttime chemistry for selected periods.

The findings of this investigation will contribute to a better understanding of how vehicle cold start emissions affect urban air quality and secondary aerosol production. This knowledge is crucial for developing regulatory frameworks and urban planning strategies aimed at reducing air pollution and improving public health.



**Figure 3.** A view of a section of the indoor parking facility in Patras, Greece used in the EASVOLEE campaign for the investigation of secondary PM production from cold start emissions.

## A newspaper article on the EASVOLEE measurement campaign in Lyon

On December 13 2024, an article by David Gossart was published in the TRIBUNE DE LYON newspaper regarding the EASVOLEE measurements in Lyon.

In response to the EASVOLEE project, IRCELyon and CRMT are equipping cars, buses, trucks, and tractors with sensors to assess the harmful effects of exhaust emissions under realistic driving conditions in the metropolitan city of Lyon.

Since autumn 2023, participants in the EASVOLEE project have been testing a range of vehicles, including city cars, station wagons, buses, agricultural vehicles, and 19-tonne heavy-duty trucks, with various engine types, such as direct injection, hybrid, internal combustion, gas, diesel, and petrol. The CRMT in Dardilly is responsible for equipping these vehicles, with the measurement equipment on the trucks weighing up to two tons. This effort requires modifying the exhaust system to collect emitted gases during driving.

You can read the article [here](#).



**Figure 4.** Newspaper page of EASVOLEE article: "Une étude lyonnaise pour dévoiler les méfaits des gaz d'échappement"

## EASVOLEE at the European Aerosol Conference 2024

The EASVOLEE had a strong presence at the European Aerosols Conference (EAC) in Tampere, Finland, from 25-30 August 2024. Several EASVOLEE partners participated in EAC2024 through various oral and poster presentations. EAC2024 topics included all the research and development fields in which aerosols are relevant. Moreover, EASVOLEE (Prof. Athanasios Nenes) co-organized a special session on Oxidative Potential of Aerosol Particles and Health Risks (related to WP3).



Figure 5. Meeting of EASVOLEE partners in EAC2024

Finally, the EAC2024 conference provided a valuable platform to connect with other academic research groups and industry experts and to discuss air quality and sustainable technologies disseminating the first EASVOLEE findings.



Figure 6. Oral presentation by FORTH researcher, Stella Manavi, in EAC2024.

## EASVOLEE at the RTR Conference 2025 in Brussels

On February 11-13, the EASVOLEE project was presented at the RTR (Results from Road Transport Research) Conference 2025 on the state of the art of European funded research projects in road transport in Brussels, Belgium. RTR was organized by the European Commission, 2Zero, ERTRAC, CCAM and Batt4EU Partnership.



Figure 7. Highlights of the RTR conference opening

The RTR Conference, held annually in Brussels brought together policymakers, researchers, and innovators to showcase Europe's most impactful road transport projects.

Prof. Spyros Pandis presented the latest findings from EASVOLEE in a dedicated session titled "Air Quality and Particles Emissions". The session featured other projects, including Npets, LEON-T and EASVOLEE sister project PAREMPI.

The conference was a great opportunity to meet with the air quality network and representatives of likeminded initiatives.



Figure 8. Prof. Pandis' presentation of the EASVOLEE project results.

Figure 9. A moment of discussion for future possible collaboration with sister project PAREMPI.



The RTR 2025 Conference attracted its largest audience to date, with more than 500 participants on-site and 400 participants joining online.

For more details about the conference, visit the official [RTR website](#).



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**We're on the Web!**

See us at:  
<http://www.easvolee.eu/>

**Follow us at:**

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## EASVOLEE special session in the EGU 2025

An EASVOLEE-themed special session ([AS3.30 Transport and air pollution from real-world emissions to their impacts](#)) has been co-organized by EASVOLEE, PAREMPI, MI-TRAP and AEROSOLS projects in the European Geophysical Union (EGU) General Assembly that will be held on 27 April -2 May 2025, both on-site in Vienna, Austria, and virtually. The session convener is Christian George (EASVOLEE) with co-conveners: Hilikka Timonen (PAREMPI), Konstantinos

Eleftheriadis (MI-TRAP), and Soheil Zeraati Rezaei (AEROSOLS).

This session will include interdisciplinary presentations (experimental and/or theoretical) ranging from characterization of emissions related to various types of transport, including emerging non-exhaust emissions, to their atmospheric transformations, and potential impacts on climate and health. Contributions will span from fundamental studies to real-world

evaluation and mitigation of transport emissions, aiming for a better description of air quality in different regions, particularly in high-impact zones. climate and health. Contributions will span from fundamental studies to real-world evaluation and mitigation of transport emissions, aiming for a better description of air quality in different regions, particularly in high-impact zones.

Stay tuned for further updates on EASVOLEE's participation, and visit the [EGU 2025 website](#) for more details.

## EASVOLEE Annual Meeting 2025

The second EASVOLEE Annual Meeting took place in person at the Foundation for Research and Technology HELLAS/Institute of Chemical Engineering Sciences in Patras (FORTH/ICE-HT) on March 5 and 6, 2025.

The first day of the meeting focused on project updates from WPs 1-3: Emissions of Organic and Other Pollutants (WP1), Atmospheric Processing of Emissions (WP2) and Health Effects of SOA

(WP3) and also included four working meetings devoted to the EASVOLEE emission measurement campaigns. The second day of the meeting included the New Simulation Tools and Emission Metrics (WP4) and Impacts and Policy (WP5) sessions, followed by the project management model presentation (WP6) by the project coordinator. The day ended with the General Assembly (GA) and Executive Board (EB)

meetings. The EB followed up on the initiatives agreed upon during the annual meeting, most importantly the collection of specific input from partners on the observational data sets used and produced, model experiments planned and process descriptions within EASVOLEE project.

The meeting was attended by 30 participants.



**Figure 10.** Group photo of the EASVOLEE Annual Meeting 2025 participants.