

UME Seminar

Self-adaptive drag reducing devices for heavy vehicles: From wind tunnel experiments to on-track testing

Dr. Manuel Lorite Diez
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Date and Time: November 20, 2025 (2 – 3 pm)

Venue: Amphi 104 (Pole Meca)

Abstract

The seminar will focus on an experimental investigation of aerodynamic drag-reducing devices for heavy vehicles. The experiments will range from standard models in wind tunnel experiments to full-scale on-track testing. The study will focus on passive self-adaptive flaps that can modify their shape and position in response to the flow around the vehicle. This reduces drag and stabilises the wake through different fluid–structure interaction mechanisms.

The analysis will cover different stiffnesses, configurations with various degrees of freedom (bending and torsion) and geometrical arrangements at the vehicle base. Tests conducted on a standard European truck (EU-HGV) and full-scale track experiments confirm that these passive systems can significantly reduce the drag coefficient and fuel consumption (by up to 2.5%), thus validating the transition from fundamental research to industrial application. These results could contribute to the development of more efficient and sustainable road transport.

About the speaker

Dr. Manuel Lorite Diez is a Ramón y Cajal Researcher (Tenure-track research position) in the University of Granada (Spain). After having received his PhD in 2019 from University of Jaén (Spain), he held postdoctoral research positions in IMFT (Toulouse, France), University of Málaga and University of Granada (Spain), where he joined the Fluid Mechanics department in 2022.

His research focuses on studying wakes behind bluff bodies, particularly in relation to reducing aerodynamic drag in 3D environments, fluid-structure interaction problems, and cutting-edge experimental techniques. He has established strong international collaborations through research stays at IMSIA-ENSTA (2017–2018, 9 months), PMMH (2025–2026, 9 months), IMFT (2022–2024, 3 months) and Universitat Rovira i Virgili (Spain).

