



BRUIT DES TRANSPORTS AÉRIENS ET TERRESTRES

AIR AND GROUND TRANSPORTATION NOISE

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| Lecturers : 16.0 | TC : 0.0 | PW : 8 | Autonomy : 0.0 | Study : 4.0 | Project : 0.0 | Language : AN

Objectives

Noise is perceived as the highest annoyance by EU citizens and noise induced stress, to which transportation noise is a major contributor, is the 2nd largest cause of pollution related diseases in Europe after air pollution, according to WHO. Therefore, sound levels both inside transportation systems and in the surrounding environment, must be considered already at design: regulatory constraints are increasingly severe; acoustic and vibratory comfort is often a key for customer choices. Transportation noise has multiple origins: propulsion and engine systems, ventilation and air conditioning, unsteady flow around vehicles... This course deals with sound sources due to the different transport modes and their consequences on the perceived noise levels inside

Keywords : Acoustics, noise, vibration, comfort, nuisances, transportation systems, car, train, aeronautics

Programme

- Transportation noise: General features, regulations and certification.
- Noise sources in air transportation. Legislation and certification. (SAFRAN AE)
- Noise reduction methods for air transportation noise. (SAFRAN AE)
- An overview of ground transportation noise: sources and mitigation
- Localisation and identification of sources. Advanced measurement techniques (SAFRAN AE).
- Analysis of structure-borne noise. Vibroacoustics. Statistical energy analysis (SEA). Basics of numerical vibroacoustics.

Learning outcomes

- Grasp the noise and vibration issues in transport
- Identify and be able to analyze noise sources in transport
- Solve typical problems in transportation noise

Independent study

- Objectifs :**
- Apply several approaches used to address transportation noise issues to practical situations.
 - Carry out a critical result analysis

- Méthodes :**
- 1 Case study
 - 2 Lab classes
 - 1 Visit

Core texts

M. P. Norton, *FUNDAMENTALS OF NOISE AND VIBRATION ANALYSIS FOR ENGINEERS*, Cambridge University Press, 1989
F. Fahy *ENGINEERING ACOUSTICS.*, Academic Press, 2001
T.D. Rossing *SPRINGER HANDBOOK OF ACOUSTICS.*, Springer Verlag, 2007

Assessment

- Score = N1 (50%) knowledge + N2 (50%) know-how
- N1: Written exam
 - N2 : Case study and lab class reports