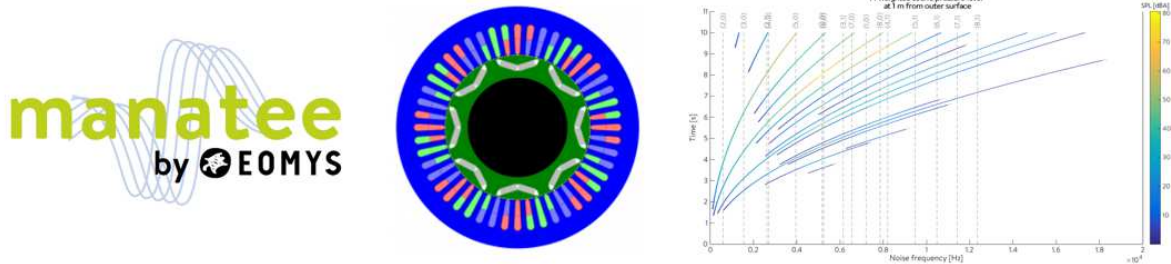


ANALYSIS AND REDUCTION OF ELECTROMAGNETIC NOISE AND VIBRATION USING MANATEE® e-NVH SIMULATION SOFTWARE



1 PEDAGOGICAL OBJECTIVES

This one-day training on MANATEE® electromagnetic and vibroacoustic simulation software has the following objectives:

- define your own electrical machine (IPMSM, SCIM, SynRM, SRM, etc) using GUI or scripting mode under Matlab
- choose the most suitable modeling level for electromagnetics, structural mechanics and acoustics
- run a variable speed e-NVH simulation under load with sinusoidal supply
- analyze your e-machine main resonances and identify the force harmonics responsible for noise
- implement relevant noise reduction technique using MANATEE® built-in noise mitigation design modules, or sensitivity studies

2 MEANS

A complete MANATEE® software license is provided to each trainee. Each trainee should bring his laptop with Matlab and FEMM installed.

3 PUBLIC

Profile: Electrical Engineers, NVH Test Engineers, CAE NVH Engineers, Mechanical Engineers

Number: max 10 people

It is highly recommended to have some preliminary knowledge of electromagnetic noise and vibrations to attend to MANATEE software training – for that check EOMYS e-NVH training sessions at www.eomys-registration.com

4 ORGANIZATION

4.1 Date, duration and language

The training on **MANATEE simulation software** lasts 6 hours:

MANATEE training: 18th of September 2020

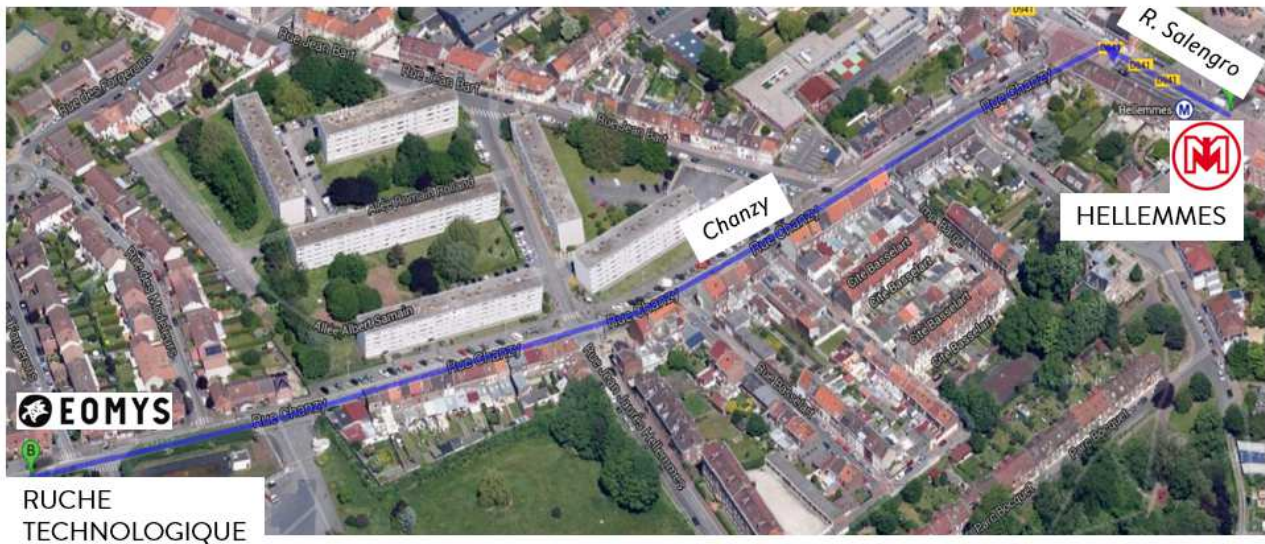
Training language is in English (slides + oral presentation) – for French-speaking trainees, some individual explanations can be delivered in French for better understanding.

4.2 Location

The training is organized at EOMYS office in Lille, FRANCE (1 hour from Paris, 1 hour 30 mn from London, 30 mn from Brussels with high speed train) at the following address:

EOMYS
Ruche d'Entreprises de Lille Hellemmes
121 rue de Chanzy
59260 Hellemmes Lille

Subway: Mairie d'Hellemmes (yellow line n° 1)
(15 mn of subway + walk from Gare Lille Flandres or Gare Lille Europe train stations)



4.3 Agenda of MANATEE training

	18 Sept 2020		e-NVH simulation using MANATEE® software
	Start	End	Description
AM	9:00	10:30	Presentation of MANATEE software modules
	10:30	10:55	Pause
	10:55	12:25	(H) Implementation of a topology
PM	12:25	13:30	Lunch break
	13:30	15:00	(H) e-NVH simulation and result interpretations
	15:00	15:25	<i>Coffee break</i>
	15:25	16:55	(H) Implementation of noise control techniques
	16:55	17:15	<i>Open questions</i>

4.4 Training cost

Formula	Cost (EUR excl. VAT) per person
1-day	500

The training cost includes coffee breaks and lunch. The training cost does not include breakfasts, accommodation and transportation.

For French companies:

EOMYS ENGINEERING est référencé DataDoc comme organisme de formation sous le numéro 3259 09376 59. Cette formation peut donc faire l'objet d'un financement partiel par votre OPCA. Pour les étudiants en thèse de doctorat, une validation de la formation en termes d'ECTS est possible, renseignez-vous auprès de votre école doctorale.

4.5 Contact and registration

Registration must be performed before 1st September 2020 online at the following link:

www.eomys-registration.com

For all information please contact Anne TRUMMER at +33 (0)7 62 41 59 12 or at the email address training@e-nvh.com

5 DETAILED PROGRAM

G. Application with MANATEE® e-NVH simulation software

Objective: detail how to simulate e-NVH in early and detailed design phase using MANATEE software, and how to redesign the machine to reduce noise and vibration levels. Trial licenses can be provided to trainees.

- G1. Overview of MANATEE electrical, electromagnetic, structural and acoustic models
- G2. Definition of machine & simulation projects
- G3. Check of geometry & winding
- G4. Open circuit / no load vibroacoustic simulation
- G5. Partial load vibroacoustic simulation
- G6. Multi simulation environment: sensitivity studies and optimization
- G7. Root cause analysis using MANATEE tools
- G8. Application of common reduction techniques (skewing, current injection, magnet shaping)
- G9. Review of all post processings of MANATEE