

## Internship Proposal

### Sound Transmission Loss extrapolation to real conditions

**Internship location:** Siemens Industry Software NV, Leuven, Belgium

**Local coach:** Dr. Jacques Cuenca ([jacques.cuenca@siemens.com](mailto:jacques.cuenca@siemens.com));

Dr. Laurent de Ryck ([laurent.deryck@siemens.com](mailto:laurent.deryck@siemens.com));

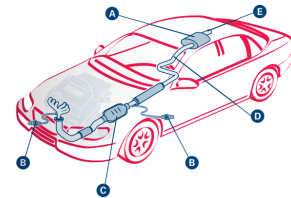
Dr. Karl Janssens ([karl.janssens@siemens.com](mailto:karl.janssens@siemens.com));

**Internship duration:** 4 to 6 months

#### Project summary:

The Sound Transmission Loss (STL) assesses the insulation characteristics of passive materials like absorptive materials and acoustic filters - mufflers, HVAC systems... A convenient setup to measure STL is the so-called impedance tube<sup>1</sup>. Measurements are performed on test samples in a laboratory, with standard and known conditions such as atmospheric pressure and temperature. However, these conditions may not reflect the real working environment for the test object. For instance, mufflers in transportation industry can be subject to very high temperatures, differing from end to end (temperature gradient).

As it is difficult to measure STL in real conditions, the purpose of this traineeship is to extrapolate laboratory measurements to any real scenario. The extrapolation consists in software modelling accounting for new parameters as the temperature gradient along the test object.



#### Project main objectives:

- § Gain skills on signal acquisition and signal processing
- § Gain insight in material testing and modelling
- § Improve current experimental acoustics techniques

#### Candidate profile:

- § Master student in Mechanical Engineering, applied physics, with knowledge in acoustics
- § Skills in experimental acquisition and related signal processing
- § Fluent in English
- § Hardware/software: Matlab; Simulink, LMS Test.Lab, LMS Virtual.Lab are an asset

#### Practical remarks:

- § Siemens Industry Software NV is hosting the student and affords for accommodation

<sup>1</sup> ASTM E2611-09: Standard Test Method for Measurement of Normal Incidence Sound Transmission of Acoustic Materials  
Based on the Transfer Matrix Method.