



The development of RAYON-PEM solver - Academic & Industrial Milestones

Marc Anciant & Lassen Mebarek¹

¹ESI-Group, 8 rue Clément Bayard, Bâtiment 3 – 2ème étage, 60200 COMPIEGNE,
FRANCE

Email: marc.anciant@esi-group.com; lassen.mebarek@esi-group.com

ABSTRACT

This presentation gives an overview of the main stages which contribute to the development of the Porous Elastic Module (PEM) in the RAYON solver, dedicated to the simulation of the Porous Elastic Media based on a mixed displacement–pressure(U,p) Formulation to solve modified Biot's equations . This covers the academic aspects, such as the implementation of the (U,p) mixed formulation established in early of year 2000, using Mixed Finite Elements (MFE). Some basic academic and industrial applications have been solved and experimentally validated in cooperation with academic and industrial partners proofing the validity of the results obtained with RAYON-PEM Solver. During the last 15 years, many projects with major automotive and aerospace partners enabled to transform this RAYON-PEM module in a robust standalone simulation tool, also called Vehicle Trim Modeler (VTM), capable to compute the vibro-acoustic response of fully trimmed vehicles, but also the Transmission Loss (TL) of some vehicle components. More recently, the RAYON-PEM module has been integrated in two other ESI-Group products (VA-One and Visual-VPS). It is now worldwide distributed and can be considered as a reference tool in the domain of the vibro-acoustic simulation for low and medium frequencies..