Extract of the paper "Short simulation activity to improve the competences in the Fluid-mechanical Engineering classroom using Solidworks® Flow Simulation"

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Abstract

In this paper, a short simulation activity based on Computational Fluid Dynamics (CFD) is raised in the context of the Mechanical Engineering Bachelor degree as an effective support to the theoretical lessons, in order to improve the competences of the Fluid-Mechanical course. The activity provides both visual and numerical information that the student must compare critically with respect the results obtained analytically, using the equations explained in the theoretical classroom. The activity is designed so that it can be integrated quickly (due to the shortage of times in the academic calendars). In this manner its total completion does not exceed four hours of simulation class. This is achieved by optimizing the resources, proposing meshing and simulation strategies that consume little computational time and using the package Solidworks® Flow Simulation, that takes advantage of the geometry parametrically modelled with the software itself to automatically establish the computational domain of the fluid for the based-on CFD analysis, saving excessive preparation times and long computational process.

Citation

M. Rodríguez-Martín, P. Rodríguez-Gonzálvez, A. Sánchez Patrocinio, and J.R. Sánchez Martín. 2019. Short simulation activity to improve the competences in the Fluid-mechanical Engineering classroom using Solidworks® Flow Simulation. In *Proceedings of the Seventh International Conference on Technological Ecosystems for Enhancing Multiculturality* (*TEEM'19*). Association for Computing Machinery, New York, NY, USA, 72–79. DOI: https://doi.org/10.1145/3362789.3362809

Keywords

Simulation; CFD; Fluid-Mechanics; Engineering education

Link to the publisher

https://dl.acm.org/doi/10.1145/3362789.3362809

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