At the Institute for Combustion Engines (VKA) under the direction of Prof. Dr.-Ing. (USA) Stefan Pischinger, research on all topics concerning the vehicle powertrain is conducted. Core focus is still the research on conventional combustion engine development like the implementation of innovative engine designs, fundamental research on more efficient combustion processes also in combination with alternative fuels or the improvement of the engine mechanics and aftertreatment systems. Additional research areas include virtual engine development, hybrid powertrains, electromobility as well as fuel cells and mechatronics for combustion engines. At any time, research is closely associated with the ongoing development of intelligent methods for test procedures and engine calibration.

Bachelor Thesis / Master Thesis

Start: 01.11.2017

☒ Faculty 1 - Mathematics, Computer Science and Natural Sciences
☒ Faculty 4 - Mechanical Engineering
☐ Faculty 6 - Electrical Engineering and Information Technology

3D-CFD Simulation of gasoline engine pollutant emissions

This work is focused on the study of emission formation mechanisms by means of 3D-CFD in-cylinder simulation of gasoline direct injection engines. The emissions in focus are both gas-form (PM/PN, HC, CO, NOx) and solid (particle). The emission modeling and the CFD setup needs to be optimized and calibrated in order to achieve good comparison with test data.

Your profile:

• Good university records
• Good knowledge of internal combustion engines, combustion process and chemistry
• Interest in interface between simulation and test bench investigations
• Preferably, previous experience with CFD simulation

Would you like to know more?
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