

## **“Optimisation of transient charge motion in Si engines”**

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**Abstract:** The further development of gasoline combustion process aims at reducing fuel consumption and exhaust gas emissions while increasing engine power. Especially in the design of high performance engines the layout of the Inlet Ports shows great influence on these goals.

Actually the industry tries to shorten the development process. Regarding this, numerical optimization methods used in fluid mechanics show a big potential. In the presentation the possibilities of “HyperStudy” in order to optimize an Inlet Port of a high performance gasoline engine are analysed with regard of volumetric efficiency and charge motion. First the state of art in numerical optimization methods of inlet ports is demonstrated. Furthermore it is discussed if common evaluation criteria for inlet ports are suitable for the optimization. Additionally the potentials to reduce simulation time in a numerical optimisation using piston- and valve motion are evaluated. Finally, there is an answer to the question, how to convert optimization results to the CAD-system.

#### **Keywords:**

- In cylinder flow
- IC engine
- Optimization