A phenomenological knock model for the development of future engine concepts

Fandakov, Alexander, author

Abstrak

The majority of 0D/1D knock models available today are known for their poor accuracy and the great effort needed for their calibration. Alexander Fandakov presents a novel, extensively validated phenomenological knock model for the development of future engine concepts within a 0D/1D simulation environment that has one engine-specific calibration parameter. Benchmarks against the models commonly used in the automotive industry reveal the huge gain in knock boundary prediction accuracy achieved with the approach proposed in this work. Thus, the new knock model contributes substantially to the efficient design of spark ignition engines employing technologies such as full-load exhaust gas recirculation, water injection, variable compression ratio or lean combustion.

Contents: