Virtual Oxygen Sensor

Innovative NOx and PM Emission Control Technologies

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Location P-15

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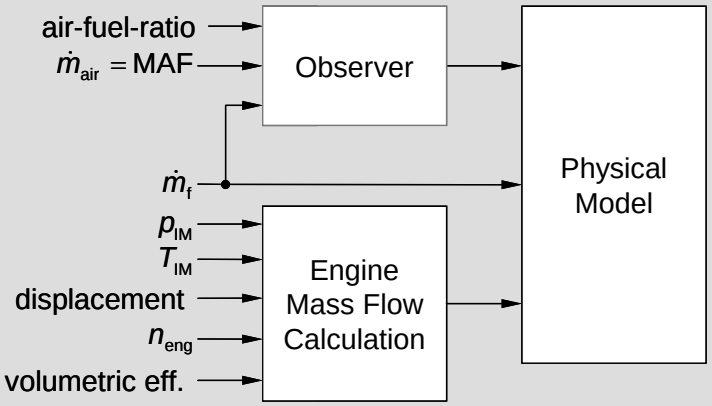

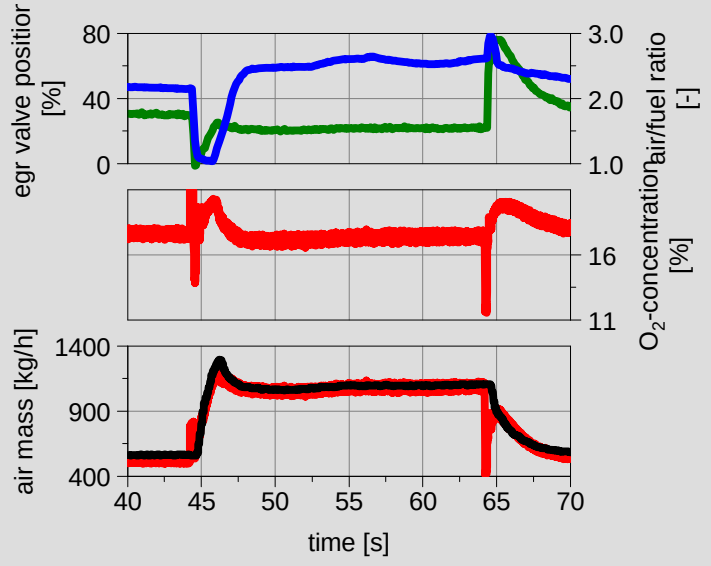

Virtual O_2-Concentration Sensor for the Intake Manifold of a Diesel Engine with EGR

- knowledge of the O_2-concentration in the intake manifold provides a direct interaction to NO_x-emissions
- with a constant EGR-rate the O_2-concentration varies depending on air-fuel ratio
- real intake manifold O_2-Sensor (hardware) $\Rightarrow$ additional costs, slow response, min. operating temperature

Virtual Intake Manifold O_2-Sensor (software)

- physical model based on MAF, fuel mass, total engine mass flow
- if exhaust O_2-Sensor available (air-fuel ratio), an adaptation with observer is possible

Results & Outlook

- comparison with stationary measurements shows good accuracy
- closed-loop control of O_2-conc. with EGR-valve