

Bundit Jiranantasak 2012: In-Cylinder Air Estimation on a Diesel Dual Fuel Engine Using a Kalman Filter Technique. Master of Engineering (Mechanical Engineering), Major Field: Mechanical Engineering, Department of Mechanical Engineering. Thesis Advisor: Assistant Professor Withit Chatrattanakulchai, Ph.D. 109 pages.

Inaccuracy of the in-cylinder air estimation decreases the engine performance because it directly relates to the combustion and the amount of injected fuel.

In this work, an Extended Kalman Filter (EKF) is proposed as observer of the in-cylinder air estimation on the engine model from AVL- Boost. We used the ideal gas law to design the system model in the intake manifold of a four cylinders engine 2.5 liter running on diesel dual fuel mode with natural gas.

The comparisons are based on simulation results between air estimation from the EKF and mass air flow (MAF) sensor. When compared to the data from MAF sensor, the EKF estimator can reduce estimation error up to 20 percent referring to the in-cylinder air from AVL-Boost.

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