

2000-01-1245

Title:

Estimating the air/fuel ratio from Gaussian parameterizations of the ionization currents in internal combustion SI engines

Abstract:

In this paper we use the idea of parameterizing the ionization current using the sum of two Gaussian functions in an indirect scheme to estimate the AFR.

In the first step of the scheme, the Gaussian functions are fitted to the ion signal using a standard least-squares fit. Then, as a second step, the AFR is estimated using the six parameters of the Gaussian functions plus the ignition angle and measurements of the engine speed.

The experimental tests show that it is possible to estimate the AFR with good accuracy, using this approach. The best results were obtained using a neural network approach and it is shown in the paper that the AFR can be estimated from the ionization current down to approximately 0.1% in mean square error.

Author(s):

Henrik Klövmark	Mecel AB
Patrik Rask	Mecel AB
Urban Forssell	Mecel AB