

Title:

SENSOR FAILURE DETECTION IN ROAD TUNNEL VENTILATION

Symposium:

Graz, 2012

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ABSTRACT

Tunnel sensors measuring traffic flow, air velocity, visibility index, carbon monoxide and nitrogen dioxide are widely installed and used in road tunnels for ventilation control. If a sensor malfunctions, it can compromise reliability, especially in cases of automatic control.

This paper proposes a method of detecting sensor failure by comparing measured and predicted values of air velocities and pollution concentrations in longitudinally ventilated tunnels. The detection method uses statistical comparisons of actual measurements and theoretical estimates of air velocities and pollution concentrations based on the evolving traffic conditions and assumed vehicle emission characteristics. The proposed method is illustrated using data collected in an actual tunnel, and assumed vehicle emission characteristics.

The proposed method is illustrated using data collected in an actual tunnel.

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