

Contribution submission to the conference Berlin 2008

road traffic monitoring and management based on magnetic imaging of vehicles — ●HAIBIN GAO¹, JOERG WOLFF¹, MICHAEL WEINMANN², STEFAN VOIT², and UWE HARTMANN¹ — ¹Physics Department, Saarland University, P.O.Box 151150, Saarbruecken,, 66041 Germany — ²Votronic GmbH, Saarbruecker Str. 8, St. Ingbert, 66386 Germany

Increasing road traffic needs optimized traffic management. Magnetic field detectors can be employed for road traffic monitoring by means of vehicle magnetic imaging. Magnetoresistive sensors utilize the earth magnetic field as a bias field for detecting the presence of ferromagnetic objects i.e., components of a vehicle. The passive method of sensing requires no energy to be emitted, thus minimizing both energy consumption and risk of electromagnetic interference. The compact size of the magnetoresistive sensors allows for versatile placement options.

The detector has three identical channels for the three-dimensional detection with a sensitivity of 1nT/Hz. The influence of temperature is nearly completely cancelled in a range of -40 degree to +85 degree. The signal is sampled and mathematically filtered within the detector. The firmware uses changes of the sum of the (unsigned) magnitudes of the signals.

So far more than a thousand magnetic profiles of passing vehicles have been recorded. The speed is obtained by using two detectors at a lateral distance of one meter. Furthermore, magnetic profiles of different vehicles are investigated for vehicle classification.

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