

Abstract Submitted to the
The International Conference on Magnetism - ICM 2009
in Karlsruhe, Germany
July 26-31, 2009

Detectors for Traffic Management Based on Magneto-Resistive Sensors

Haibin Gao¹, Stefan Voit², Uwe Hartmann¹

¹ *Experimental Physics, Saarland University, Campus C 6 3, D-66123 Saarbrücken, Germany*

² *Votronic GmbH, St. Ingbert, Germany*

An ever increasing traffic requires for optimized traffic management from both economic and safety reasons. That holds for road, railway and air traffic. A detector based on magneto-resistive sensors was developed to detect vehicles due to the local disturbance of earth's magnetic field. The detector has three identical channels for the detection of the vector field at a sensitivity of $1 \text{ nT}/\sqrt{\text{Hz}}$. The influence of temperature is nearly completely cancelled out in a range of $-40 \text{ }^\circ\text{C}$ to $+85 \text{ }^\circ\text{C}$. The three-axis signal is sampled and digitally filtered on board. Various applications of the detector have been demonstrated. A car park guiding system with an array of more than 100 detectors is used to indicate an efficient allocation of parking lots. Detectors were also installed at three European airports to monitor aircraft movements on taxiways and at gates. In addition, detectors were used to detect the actual train locations during railway marshalling processes.