

Measurement Based Performance Evaluation of Advanced Tyre Monitoring Systems using RFID technology

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ABSTRACT

Currently, Tyre Pressure Monitoring Systems (TPMS) are in widespread commercial use for state-of-the-art vehicles and TPMS are (or will soon be) mandated by legislation in several countries. State-of-the-art TPMS technology is based on rather costly battery powered sensor units, often mounted at the wheel rim. Advanced tyre monitoring systems will evolve to sense not just the static tyre pressure, but also several dynamic tyre state variables, e.g., tyre contact area (“foot print”), slip angle, vibrations, age, and temperature, while simultaneously reducing the costs and environmental burden caused by their widespread commercial deployment. Advanced Tyre Monitoring Systems will be mounted within the tyre rather than at the wheel rim and avoid batteries through energy harvesting for sensor powering. In this contribution we evaluate the use of RFID technology for tyre embedded sensors based on near-field radio channel measurements at 866 MHz and 2.45 GHz within a real-world vehicle.