

Train Detection by Magnetic Field Sensing

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The recent boom in the development of high-speed railways has stimulated the need for train detection technology to enhance safety and reliability. In this paper, we propose a new technique of train detection through magnetic field sensing by giant magnetoresistive sensors. This technology was studied by the analysis of magnetic field distribution in the high-speed rail system obtained from modeling and simulation. The results verify the feasibility of our technology for the detection of train presence, speed, length, and number of rolling stocks. It can overcome the limitations of track circuits and provide additional measurement capabilities to the signaling system. This detection system is of low cost and minimal maintenance load as well as compacted construction. Thus, it may serve as a new train detection system to help enhance and promote the safety and reliability of high-speed railways.

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