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## **Magnetoresistive Devices for Industrial Applications: Improvement of Thermal Robustness**

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Magnetoresistive sensors utilize multilayers of magnetic and non-magnetic thin films to convert magnetic field changes into electrical resistance variations. Critical components include the sensing layer and the reference layer, stabilized by an exchange bias with an antiferromagnetic layer. The performance of these sensors is influenced by factors such as layer thickness, material compatibility, and thermal stability. Key attributes—high magnetoresistance ratio, broad linear range, and thermal stability—are tailored for various applications, from biological detection to automotive sensing. Optimizing these characteristics, particularly using MnNi as an antiferromagnet and a soft-pinning strategy, aims to enhance sensor performance in terms of linear range, high-field detection, and thermal stability, advancing the field of magnetoresistive sensor technology.

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