



## SENSOR PERFORMANCE OF CANTILEVERED MAGNETOSTRICTIVE BEAM

Cao Qinghua<sup>1,2,3</sup>, Chen Dingfang<sup>2</sup>, Lu Quanguo<sup>3</sup>, Tang gang<sup>3</sup>, Yan Jianwu<sup>3</sup>, Zhu Zhifang<sup>3</sup>, Xu Bin<sup>3</sup>,  
Zhao Ran<sup>3</sup>, Zhang Xiaoxing<sup>3</sup>

1, School of Automation, Wuhan University of Technology, Wuhan, China

2, Institute of Intelligent Manufacturing and Control, Wuhan University of Technology, Wuhan,  
China

3, Institute of Micro/nano Actuation and Control, Nanchang Institute of Technology, Nanchang,  
China

Email: [qh9863@126.com](mailto:qh9863@126.com)<sup>1</sup>; [cadcs@126.com](mailto:cadcs@126.com)<sup>2</sup>

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*Abstract- A nonlinear couple modeling of magnetostrictive cantilever is built by combining Gibb's free energy formulation with the Euler-Bernoulli beam theory. The Gibb's free energy corresponding to different orientations in 3D space can be expressed in terms of their direction cosines, the stress at a given point can be described by classical theory. The magnetomechanical bending experimental setup is designed. The results demonstrated magnetostrictive sensing can be performed in bending even when both tensile and compressive stresses are developed; meanwhile the sensing is primarily due to the dominating effect of compression over tension.*

**Index terms:** Magnetostrictive, beam, nonlinear couple, sensor performance