

# Active LR integrator circuit for drift-free magnetoelastic transducers

Piotr Gazda,<sup>1</sup> Michał Nowicki,<sup>1</sup> and Maciej Kachniarz<sup>2</sup>

<sup>1</sup>*Institute of Metrology and Biomedical Engineering,  
Warsaw University of Technology,*

*Andrzeja Boboli 8, 02-525 Warsaw, Poland*

<sup>2</sup>*Industrial Research Institute for Automation and Measurements PIAP,  
Al. Jerozolimskie 202, 02-486 Warsaw, Poland*

Current integrator systems usually use active RC integrator circuits. Crucial difficulty associated with this analog system is the integrator drift. The following paper presents the idea of the active integrator circuit based on inductive and resistive components. This concept allows to eliminate the time drift of the circuit, which is undesired phenomena resulting from capacitive components working in the traditional negative feedback loop. The SPICE simulations were performed to validate the presented idea. Then, prototype circuit with discrete components was tested. Inductors were based on nanocrystalline and air cores. The developed solution was tested as magnetoelastic sensors transducer, to confirm the ability for long-term, continuous, drift-free, integrator circuit operation. The results were compared with traditional, RC circuit with automatic drift compensation.