Special Issue

Advances in High-Precision Magnetic Levitation Actuators

Message from the Guest Editors

Magnetic levitation is widely used in various fields, including rail transit, bearings, motors, precision motion systems, microactuators, biomedicine, chemistry and materials science. Because there is no mechanical contact, magnetic levitation systems have the advantages of friction-free motion, multi-degree-of-freedom drive, vacuum compatibility, response speed, pollution-free operation, etc. Therefore, the drive and control of magnetic levitation systems have attracted extensive attention in the past decades.

The purpose of this Special Issue is to collect valuable theoretical, simulational and experimental results of novel structure designs, perfomance optimizations, multi-field coupling, function coupling or decoupling, and control issues of both the magnetic levitation and driver, as well as the relevant core components, prototypes, and case analysis research for practical applications such as magnetic levitation bearings, plane motors, magnetic levitation precision positioning, levitation microactuators, particle and cell manipulation, and magnetic robot drive.

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About the Journal

Message from the Editorial Board

We are just entering the Next Wave of Technology (NWT) where actuators will play the same role as the computer chip did for computers/social media approximately four decades ago. Just in the U.S., production of $1 trillion year of electromechanical systems (vehicles, orthotics, manufacturing cells, freight trains, aircraft, etc.) will be impacted by the NWT, all driven by actuators. Five key trends can be found for the future perspectives: “Performance to Reliability”, “Hard to Soft”, “Macro to Nano”, “Homo to Hetero” and “Single to Multi functional”. We invite papers that primarily impact these economic sectors; those illustrating basic scientific principles are also welcome.

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