Electromagnetic vibration energy harvesting devices: architectures, design, modeling and optimization

Spreemann, Dirk, author

Abstrak

Electromagnetic vibration energy harvesting devices introduces an optimization approach which is applied to determine optimal dimensions of the components (magnet, coil and back iron). Eight different commonly applied coupling architectures are investigated. The results show that correct dimensions are of great significance for maximizing the efficiency of the energy conversion. A comparison yields the architectures with the best output performance capability which should be preferably employed in applications. A prototype development is used to demonstrate how the optimization calculations can be integrated into the design?flow. Electromagnetic vibration energy harvesting devices targets the designer of electromagnetic vibration transducers who wishes to have a greater in-depth understanding for maximizing the output performance.