

# Collaboration and Invisible Gap between Magnetics & Power Electronics Researchers

- Toward Better Magnetic Design of Inverter-Driven Equipment -

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Many of the manufacturing industries meet revolutionary change in high-power electronics, controls, and communication links. Everyone in this scientific/technological field believes that magnetic and power electronic co-design/analysis greatly improve the equipment performance and extensively the quality of life. Nevertheless everyone also feels invisible gap between magnetic and power electronic approaches to solve the problems. In particular, design of non-linear magnetic core losses under non-sinusoidal wave excitation is a matter of common concern but differently approached by the two communities.

This talk firstly reviews the magnetic approach to analyze the core losses, which is featured by physical and material-scientific interests. Then power-system approach from the power electronics community will be introduced. The author suggests magnetic researchers to try finding physical/material meaning of behavior models suggested by power electronics side, and power electronics researchers to develop tools to apply non-sinusoidal magnetic field source to magnetics side.

## Reference

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- 2) Preisach
- 3) D. C Jiles
- 4) Play
- 5) Sakaki
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