Low Cost Soft Magnets for Power Transformers, Electric Motors, and Current Sensors

By
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Host: Assoc Prof Sum Tze Chien

Abstract

Over several decades, soft magnets have been studied for various applications ranging from power transformers, electric motors and current sensors. The types of soft magnets investigated include amorphous, crystalline, and also nanocrystalline ones. Various soft magnets with wide range of properties have been developed using different synthesis techniques such as melt spinning and in-water rotating wheel. Progress has also been made on the processing and post-synthesis treatments (e.g. field annealing, strain annealing) to tailor the soft magnetic properties for different engineering applications.

This seminar will review the basics of soft magnets from the perspective of synthesis, structure, properties, and performance. The roles of soft magnets in power transformers, electric motors, and current sensors will be discussed in detail. The last part of the talk will cover the most recent developments and future of power transformers, electric motors, and current sensors.

Short Biography

Michael Kurniawan was among the first batch of PAP-SPMS undergraduates and obtained his B.Sc with 1st Class Honours in 2009. In the following 3 years, Michael was a member of the XC-Lab and worked on the ultrafast dynamics of organic solar cells under the supervision of Prof Sum Tze Chien and Prof Alfred Huan. In 2012, Michael graduated from XC-Lab to embark on his graduate study in Materials Science and Engineering at Carnegie Mellon University and completed the program in 2015. His thesis topic focused on the development of low cost soft magnets for power transformers, electric motors, and current sensors.