MT 26
International Conference on Magnet Technology
Vancouver, Canada | 2019

Contribution ID: **1310** Type: **Poster Presentation**

Thu-Mo-Po4.07-01 [46]: Core Loss Characteristics and Model Verification of Nanocrystalline Alloys Under Complex Working Conditions

Thursday 26 September 2019 08:45 (2 hours)

In order to saving energy and reducing consumption, making full development of advanced materials has been a global consensus. Nanocrystalline alloys, compared with ferrite, have high permeability, high saturation flux density and relatively low core loss. Due to the lack of magnetic properties under complex working conditions, its application in high power density applications have been limited.
Most of the existing core loss models are based on sinusoidal excitation, thus a modified loss separation formula is first introduced and discussed. In order to establish the core loss model of nanocrystalline alloys under complex working conditions, a testing platform for the magnetic properties under complex working conditions is established. Core loss under room temperature (20℃) and sinusoidal conditions is measured to verify the original loss separation (OLS) method. The accuracy of loss separation method is improved by modifying the loss separation formula. Then it is extended to the modified loss separation method, which is suitable for prediction of core loss complex working conditions. On this basis, calculated and experimental results under complicated conditions with different ambient temperature and excitation waveform are compared. The results show that the core loss difference between the calculation and the measurement is very small, which verify the accuracy of the modified loss separation model. At the same time, compared with the existing models, this modified loss separation model has a certain improvement in calculation accuracy.

Authors: WU, Shipu (Hebei University of Technology); Dr LIU, Chengcheng (Hebei University of Technology); Prof. WANG, Youhua (Hebei University of Technology)

Presenter: Dr LIU, Chengcheng (Hebei University of Technology)

Session Classification: Thu-Mo-Po4.07 - Magnetization and AC Losses II