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**Electrophoretic deposition of graphene oxide on magnetic ribbon: toward high sensitive and selectable magnetoimpedance response**

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**Abstract**

Graphene oxide (GO) layers have shown to be fascinating elements for application in high performance sensors. They can be applied in multi-disciplinary designs based on surface selective sensing mechanisms. One immediate application of such surface sensitive elements is implementing of GO layer in magnetoimpedance (MI) sensors to improve their multi-functionality. In this paper, deposition of GO on the surface of Co-based amorphous ribbons ( $\text{Co}_{68.15}\text{Fe}_{4.35}\text{Si}_{12.5}\text{B}_{15}$ ) is performed using electrophoretic deposition (EPD) method to evaluate the MI response. MI ratio increased from 271% (bare ribbon) up to 281% and 301% EPD GO deposited within 4 and 8 min, respectively. Similar experiment for the ribbon drop coated with GO was carried out while no enhancement in MI response was seen. Vertical growth of GO on the surface of the ribbon in EPD and drop coated layers observed by topographical measurements. We explained the difference between the MI responses based on layers verticality and surface coverage. UV-Visible absorption and Raman spectroscopy were used to study the nature of GO. Gaining a high surface area of GO along with their biocompatible and anticorrosive properties atop the MI sensors can open pathways towards increasing applications of surface selective and high sensitive MI sensors.

**Keyword:** Electrophoretic deposition, Magnetoimpedance sensor, Graphene oxide

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