

03,05

Negative Magnetoresistance Phenomenon in Diluted Granular Multilayers $\text{Co}_{80}\text{Fe}_{20}(t)|\text{Al}_2\text{O}_3$

© A. El Oujdi¹, A. El Kaaouachi^{2,¶}, A. Echchelh¹, B. AitHammou², R. Tiskatine³, S. Dlimi³

¹ Laboratory of Energetic Engineering and Materials, Faculty of Sciences Ibn Tofail, Kenitra, Morocco

² MPAC group, Faculty of Sciences, BP 8106, 80000, Agadir, Morocco

³ Physics department, Faculty of Sciences, 80000, Agadir, Morocco

¶ E-mail: kaaouachi21@yahoo.fr

Received: November 6, 2019

Revised: December 22, 2019

Accepted: December 27, 2019

Several complex theories explaining the phenomenon of negative magnetoresistance (NMR) are discussed, observed in insulating diluted granular multilayers $\text{Co}_{80}\text{Fe}_{20}(t)|\text{Al}_2\text{O}_3$. In fact, this investigation is re-analyzing the experimental measurements of $\text{Co}_{80}\text{Fe}_{20}$ with low nominal thickness $t = 0.7$ nm of granular layers obtained by H.G. Silva et al. [18]. Two theories such as quantum interference model and localized magnetic moments model are confronted with experimental measurements in order to provide physical explanations to NMR phenomenon.

Keywords: $\text{Co}_{80}\text{Fe}_{20}$, negative magnetoresistance, quantum interference, localized magnetic moments model, granular system, magnetic field.