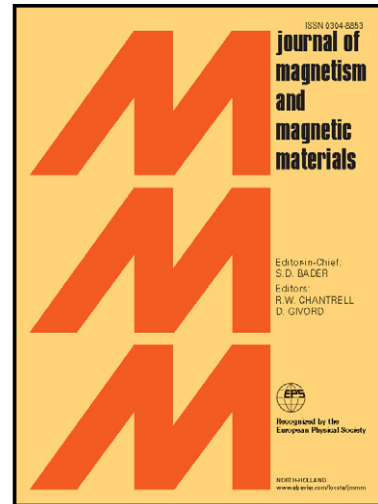


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**Microwave absorbing properties and structural design of microwave absorbers
based on polyaniline and polyaniline/magnetite nanocomposite**

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Abstract

Double-layer absorbers with enhanced microwave absorbing properties were designed based on polyaniline and polyaniline/magnetite composite with a total thickness of 1 mm. The double-layer microwave absorbers have better microwave absorbing properties than those of single-layer microwave absorbers, and the microwave absorbing properties of the double-layer structure are influenced by the coupling interactions between the absorbing layer and matching layer. When the absorbing layer is PANI with a thickness of 0.4 mm, and the matching layer is PANI/Fe₃O₄ composite with a thickness of 0.6 mm, the minimum reflection loss (R_L) reaches -42 dB at 29.27 GHz and the absorption bandwidth with R_L below -10 dB is about 11.8 GHz. While, when PANI and PANI/Fe₃O₄ composite are acted as matching layer and absorbing layer, respectively, with the same thickness of 0.5 mm, a minimum R_L value of -54 dB is observed at 33.72 GHz and the absorption bandwidth is about 11.28 GHz ranging from 27.24 to 38.52 GHz with the R_L value below -10 dB.

Keywords: Polyaniline; Magnetite; Double-layer; Microwave absorption; Ka band

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