Supplementary Information

Dissipation Enhancement Effect from Titania Semiconductor Modulation of Graphene-based Electromagnetic Absorbing Composites

Yi Lixi*  Wu Jinwu

School of Aircraft Engineering, Nanchang Hangkong University, Nanchang 330063, China

* Corresponding author.
E-mail address: yilixi@nchu.edu.cn.
Figure S1 Energy flux density of electromagnetic wave in absorber. (a)GM (Exfoliated GNS and manganese oxides 1:1 ) , (b) GMT10, (c) GMT30, (d) GMT50, and (e) GT composite samples. See online version for color display.
Figure S2 Eddy current coefficient $C_0$ of composite samples with addition of titania. To display different sample curves as much as possible, the symbols are set in different sizes. The inset figure with a scale in very small magnitude of E-9 to E-10 shows some differences in high resolution. Though there are tiny waves in the high frequency end for $C_0$, which are almost constant in the main range.

Table S1 Increment of semiconductor titania introduction to electromagnetic type composites

| Thickness | EM component | Magnetic graphene | Magnetic $\text{ZnFe}_2\text{O}_4$ | Magnetic $\text{ZnFe}_2\text{O}_4$@graphene | GNS-EMO |
|-----------|--------------|------------------|----------------------------------|-------------------------------------------|---------|
| 4mm       | Reflection loss(dB) | ~20(HF) | ~18(LF) | ~4.25 | ~13.65(LF)/8.5(HF) | ~4.78(HF) |
| Modulation components | | ~25(HF) | ~9(LF) | — | ~31(LF)/12.5(HF) | 9.91(HF) |
| Before titania introduction | | 5(HF) | -9 (LF) | — | 17.35(LF)/4.5(HF) | 5.13(HF) |
| @TiO$_2$ | | | | | | |
| Loss increment(dB) | | | | | | |
| Ref. | | | | | | |
| | | | | | | [28] [32] This work |

HF and LH refer to high frequency and low frequency end, respectively.