



NATO Advanced Research Workshop

RPTU

Functional Spintronic Nanomaterials for Radiation Detection and Energy Harvesting



Magnetic nanocomposites for advanced technical and medical applications

^{1*}Tovstolytkin A.I., ^{1,2}Polishchuk D.M., ¹Borynskyi V.Yu., ^{1,2}Kravets A.F.

¹ atov@imag.kiev.ua, Institute of Magnetism of the NAS of Ukraine and MES of Ukraine, Ukraine

² Nanostructure Physics, Royal Institute of Technology, Sweden

Current trends in the development of devices based on magnetic materials have been outlined. It is emphasized that an important direction is the development and research of advanced nanocomposites, the use of which will lead to a reduction in size, an increase in speed and an extension of the functionality of practical applications [1]. It is noted that the research carried out at the Institute of Magnetism of the National Academy of Sciences of Ukraine and Ministry of Education and Science of Ukraine is in line with modern world trends. The results of research on composite nanostructures with an antiferromagnetic component are presented [2,3]. The results of scientific activities aimed at the development and research of magnetic nanomaterials for medicine, in particular for self-controlled magnetic hyperthermia, are highlighted [4].

Reference list

1. Chumak A.V. *et al.* Advances in Magnetism Roadmap on Spin-Wave Computing. IEEE Transactions on Magnetism, 2022, 58(6): 1 - 72. <https://doi.org/10.1109/TMAG.2022.3149664>
2. Polishchuk D.M., Polek T.I., Borynskyi V.Yu., Kravets A.F., Tovstolytkin A.I., Korenivski V. Isotropic FMR frequency enhancement in thin Py/FeMn bilayers under strong magnetic proximity effect. J. Phys. D: Appl. Phys., 2021, 54(30): 305003. <https://doi.org/10.1088/1361-6463/abfe39>
3. Borynskyi V.Yu., Polishchuk D.M., Melnyk A.K., Kravets A.F., Tovstolytkin A.I., Korenivski V. Higher-order ferromagnetic resonances in periodic arrays of synthetic-antiferromagnet nanodisks. Appl. Phys. Lett., 2021, 119(19): 192402. <https://doi.org/10.1063/5.0068111>
4. Kalita V.M., Polishchuk D.M., Kovalchuk D.G., Bodnaruk A.V., Solopan S.O., Tovstolytkin A.I., Ryabchenko S.M., Belous A.G. Interplay between superparamagnetic and blocked behavior in an ensemble of lanthanum–strontium manganite nanoparticles. Phys. Chem. Chem. Phys., 2017, 19: 27015 - 27024. <https://doi.org/10.1039/C7CP05547A>