

Defect induced magnetism in ZnO: a first spintronic device application

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The phenomenon Defect-Induced Magnetism (DIM) has been found in a broad spectrum of materials, like graphite and several oxides. The evidence obtained by very different experimental methods leaves no doubt about its intrinsic origin. An interesting example of DIM in oxides is found in ZnO, which is induced by increasing the concentration of Zn vacancies through, e.g., proton irradiation [1], with a Curie temperature far above 300K [1-2]. In this work we present a first working spintronic application of DIM, namely a spin filter and magnetic sensor based on ZnO nanostructures, in which vacancies were produced through low-energy plasma treatment.

References:

[1] M. Khalid et al., New J. Phys. 13, 063017 (2011)

[2] I. Lorite et al., Appl. Phys. Lett. 106, 082406 (2015)