Layered materials as an active part of magnetic field sensors

W. Koczorowski[1,2], S. El-Ahmar[2], J. Dembowiak[2], P. Kuświk[1,3], M. Przychodnia[2], R. Czajka[2]

[1] *Centre for Advanced Technologies, Adam Mickiewicz University, ul. Umultowska 89C, 61-614 Poznań, Poland*
[2] *Institute of Physics, Faculty of Technical Physics, Poznan University of Technology, ul. Piotrowo 3, Poznań, 60-965, Poland*
[3] *Institute of Molecular Physics, Polish Academy of Sciences, Smoluchowskiego 17, 60-179 Poznań, Poland*
email: wojciech.koczorowski@put.poznan.pl

Layered materials, like grapheme, topological insulators (TI) or transition metal dichalcogenide (TMD), offer specific physical and chemical properties [1, 2, 3]. These properties allow to consider a single or several layers of these materials as an active parts of various devices, see e.g. [4]. This is promising approach for further devices miniaturisation where the single atomic layer is a natural limit of the channel thickness.

In the presentation the methods for micro-devices in the planar architecture will be presented [5]. The main tool used in experiments is mask-less optical lithography technique and it is used for both: channel formation or further electrodes formation by metal deposition. The examples of operational magnetic field sensors with geometric dimensions in the sub-milimeter scale, containing Graphene or Bi_2Se_3 flakes as the active parts will be presented and discussed [5, 6]. These fabricated sensors use different designs, including Hall's cross, planar extraordinary magnetoresistance, and modified magnetoresistor [5, 6]. Finally their properties will be compared between materials and architectures.

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