Belarusian State University
of Informatics and Radioelectronics
R&D Department
BSUIR, 6, P. Brovki Str., Minsk 220013, Republic of Belarus

Theoretical and experimental study of the magnetic properties of nanostructured magnetic semiconductor compounds

Key research objectives:

- Perform calculations of the exchange interaction and crystal magnetic anisotropy by quantum mechanical modeling of the studied compounds;
- Determine the micro-and macroscopic magnetic parameters based on the results of quantum mechanical modeling and phenomenological models: Curie temperature, exchange constant, exchange interaction field, saturation magnetization, magnetic anisotropy field, Bloch constant, etc.;
- Conduct experimental studies for the materials and structures under consideration.

Relevance of the research:

To study the mechanisms of exchange interaction and the conditions for the occurrence of the magnetic order, it is possible to use the methods of quantum-mechanical modeling from the first principles of crystal structures, as well as magnetic phenomenological models (which allows for realistic modeling of the macroscopic magnetic parameters of complex compounds).

The result of the combination of quantum-mechanical modeling and the phenomenological approach is a method for calculating the exchange interaction integral, which is necessary to determine the type of magnetic order, as well as the most critical magnetic parameters (Curie temperature, exchange constant, saturation magnetization, Bloch constant).

Type of collaboration

research cooperation

Key words

semiconductor, magnetic, quantum mechanical, modeling

Contacts

Head of research
Viktor Stempitsky
PhD, Associate Professor
vstem@bsuir.by

Technology Transfer
science@bsuir.by