

# Normal and inverse magnetocaloric effect in magnetic multilayers with antiferromagnetic interlayer coupling

K. Szałowski<sup>1</sup> and T. Balcerzak<sup>1</sup>

<sup>1</sup>*Department of Solid State Physics, University of Łódź,  
ul. Pomorska 149/153, 90-236 Łódź*

Layered and dilute magnets with antiferromagnetic coupling between ferromagnetically ordered planes exhibit interesting phenomena like magnetic compensation [1]. In the paper we characterize such spin-1/2 multilayer structure in external magnetic field within Pair Approximation [2-4], focusing on its magnetocaloric properties. We study extensively the isothermal entropy change for the system vs. interaction parameters, dilution and field. We show the existence of both direct and inverse magnetocaloric effect (MCE), depending on temperature range and external field amplitude. This MCE is highly sensitive to inter- and intralayer couplings and its temperature dependence falls within two categories corresponding to the presence or absence of compensation.

## References:

- [1] T. Balcerzak, K. Szałowski, *Physica A* **395**, 183 (2014)
- [2] K. Szałowski, T. Balcerzak, A. Bobák, J. Magn. Magn. Mater. **323**, 2095 (2011)
- [3] K. Szałowski, T. Balcerzak, *Physica A* **391**, 2197 (2012)
- [4] K. Szałowski, T. Balcerzak, *Thin Solid Films* **534**, 546 (2013)

*This work has been supported by Polish Ministry of Science and Higher Education on a special purpose grant to fund the research and development activities and tasks associated with them, serving the development of young scientists and doctoral students.*