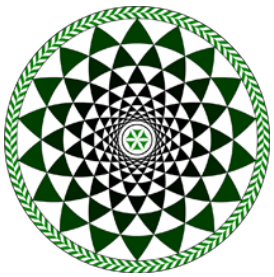

Contribution ID: **20** Type: **poster presentation**

Magnonic excitations in low dimensional inhomogeneous nanostructures

Tuesday, 4 July 2017 19:10 (2 hours)

There is a continuous interest in a size reduction of the magnetic data storage devices. The most promising route to the miniaturization is offered by modern spintronics, also based on molecular magnetic materials, that allows one to control the architecture of individual spin arrangements to an unprecedented precision. In the poster we will present elementary excitations in selected linear and branched chains of spins consisting of segments differing in strength of magnetic coupling. Different kinds of anisotropy will be also considered. The method of calculations originates from the dynamical matrix technique [1]. The surface and interface response function (Green function) theory [2] will be used to treat the junctions of different segments. The surface and/or interface excitations (magnons) correspond to poles of the appropriate Green functions. For some parameters the excitations appear on the background of the bands of bulk waves, whereas in other cases they transform into finite-lived interface resonances. We also calculate reflection and transmission coefficients for the magnons at the junctions.

References

[1] A.Wal Band structure, Brillouin zone, and condensation of states for an itinerant electron in a magnetic quantum dot, *Physica B* **410**, 222–226 (2013).

[2] L. Dobrzynski, A. Akjouj, B. Djafari-Rouhani, J. O. Vasseur, M. Bouazaoui, J. P. Vilcot, H. Al Wahsh, P. Zielinski, and J. P. Vigneron, Simple nanometric plasmon multiplexer, *Phys. Rev. E* **69**, 035601(R) (2004).

Primary author: Ms KUŹMA, Dominika (Institute of Nuclear Physics PAN)

Co-authors: Prof. WAL, Andrzej (University of Rzeszów); Prof. MONTONCELLO, Federico (Department of Physics, University of Ferrara); Dr SOBIESZCZYK, Paweł (Institute of Nuclear Physics PAN); Prof. ZIELIŃSKI, Piotr (Institute of Nuclear Physics PAN)

Presenter: Ms KUŹMA, Dominika (Institute of Nuclear Physics PAN)

Session Classification: Poster Session

Track Classification: Surfaces and interfaces