



Contribution ID: 142

Type: **Talk**

[102] Nano-scale magnonic directional coupler

Tuesday, 31 August 2021 13:45 (15 minutes)

Magnons, the quanta of spin waves, could be used to encode information in beyond-Moore computing applications. Here, we report a nano-scale magnonic directional coupler based on yttrium iron garnet, which can function as circuit building blocks. The coupler consists of single-mode waveguides with a width of 350 nm. We use the amplitude of a spin wave to encode information and to guide it to one of the two outputs of the coupler depending on the signal magnitude, frequency and the applied magnetic field. Using micromagnetic simulations, we also propose an integrated magnonic half-adder that consists of two directional couplers and we investigate its functionality for information processing.

Primary author: Prof. CHUMAK, Andrii (University of Vienna)

Co-authors: WANG, Qi (University of Vienna); Mr KEWENIG, Martin (TU Kaiserslautern, Germany); Mr SCHNEIDER, Michael (TU Kaiserslautern, Germany); Dr VERBA, Roman (Institute of Magnetism, Kyiv, Ukraine); Mr KOHL, Felix (TU Kaiserslautern, Germany); Mr HEINZ, Björn (TU Kaiserslautern, Germany); Mr GEILEN, Moritz (TU Kaiserslautern, Germany); Mr MOHSENI, Morteza (TU Kaiserslautern, Germany); Dr LÄGEL, Bert (TU Kaiserslautern, Germany); Dr CIUBOTARU, Florin (Imec, Leuven, Belgium); Dr ADELMANN, Christoph (Imec, Leuven, Belgium); Dr DUBS, Carsten (INNOVENT e.V., Technologieentwicklung, Jena, Germany); Prof. COTOFANA, Sorin (Delft University of Technology, Delft, The Netherlands); Dr DOBROVOLSKIY, Oleksandr (University of Vienna); Dr BRÄCHER, Thomas (TU Kaiserslautern, Germany); Prof. PIRRO, Philipp (TU Kaiserslautern, Germany)

Presenter: Prof. CHUMAK, Andrii (University of Vienna)

Session Classification: Condensed Matter Physics

Track Classification: Condensed Matter Physics (KOND)