



Contribution ID: 3

Type: **Talk**

[101] Cherenkov radiation of spin waves by ultra-fast-moving magnetic flux quanta

Tuesday, August 31, 2021 1:30 PM (15 minutes)

Despite theoretical predictions for the Cherenkov radiation of spin waves (magnons) by various propagating magnetic perturbations, it has not been observed so far. Our recent experiments arXiv:2103.10156 evidence the Cherenkov radiation of magnons in a Co-Fe magnonic conduit by fast-moving magnetic flux quanta (Abrikosov vortices) in an adjacent Nb-C superconducting strip. The radiation is evidenced by the microwave detection of spin waves and it is accompanied by a magnon Shapiro step in superconductor's current-voltage curve. The spin-wave excitation is unidirectional and monochromatic, with sub-40 nm wavelengths determined by the period of the vortex lattice. The magnon/fluxon phase-locking limits the vortex velocity and reduces the dissipation in the superconductor.

Primary authors: DOBROVOLSKIY, Oleksandr (University of Vienna); WANG, Qi (University of Vienna); VODOLAZOV, Denis (Institute for Physics of Microstructures, RAS, Afonino, Russia); BUDINSKÁ, Barbora (University of Vienna); SACHSER, Roland (Physics Institute, Goethe University Frankfurt am Main, Germany); CHUMAK, Andrii (University of Vienna); HUTH, Michael (Physics Institute, Goethe University Frankfurt am Main, Germany); BUZDIN, Alexander (Universite Bordeaux, CNRS, LOMA, Talence, France)

Presenter: DOBROVOLSKIY, Oleksandr (University of Vienna)

Session Classification: Condensed Matter Physics

Track Classification: Condensed Matter Physics (KOND)