



Wednesday, January 25th 2017 - 14:00
CFEL Seminar room I (Bldg. 99)

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Reflection, Transmission, and Transformation of Electromagnetic Waves in Layered Superconductors

The presentation aims to give a brief review of several theoretical works carried out for layered superconductors [1-4]. It will be shown that the dependence of the transmission coefficient of nonlinear THz waves on the incident wave amplitude shows hysteretic behavior both when the waves are propagating along and across superconducting layers. The polarization transformation of incident waves after their reflection and transmission through a layered superconductor can occur. However, there exist two waves with mutually orthogonal polarizations, which practically do not interact with each other even in the nonlinear case. Using these two mutually orthogonal polarizations, we study polarization transformation of nonlinear transverse electric and transverse magnetic waves. In addition, we show that external magnetic field can be effectively used to control transparency and polarization transformation in layered superconductors.

More details can be found here:

1. T.N. Rokhmanova, S.S. Apostolov, Z.A. Maizelis, V.A. Yampol'skii, Franco Nori Self-induced THz-waves transmissivity of waveguides with finite-length layered superconductors // *Physical Review B*. – 2013. – V. 88. – P. 014506 [10 pp]. [<http://journals.aps.org/prb/abstract/10.1103/PhysRevB.88.014506>]
2. T.N. Rokhmanova, S.S. Apostolov, Z.A. Maizelis, V.A. Yampol'skii, Franco Nori Superposition principle for nonlinear Josephson plasma waves in layered superconductors // *Physical Review B*. – 2014. – V. 90, № 18. – P. 184503 [9 pp]. [<http://journals.aps.org/prb/abstract/10.1103/PhysRevB.90.184503>]
3. S.S. Apostolov, Z.A. Maizelis, N.M. Makarov, F. Perez-Rodriguez, T.N. Rokhmanova, V.A. Yampol'skii Transmission of THz waves through layered superconductors controlled by a dc magnetic field // *Physical Review B*. – 2016. – V.94. № 2. – P. 024513 [8 pp]. [<http://journals.aps.org/prb/abstract/10.1103/PhysRevB.94.024513>]
4. T.N. Rokhmanova, S.S. Apostolov, Z.A. Maizelis, V.A. Yampol'skii Transformation of the polarization of the electromagnetic waves reflected from the layered superconductors in an external dc magnetic field // *Low Temperature Physics*, – 2016. – V. 42. – P. 916-923. [<http://scitation.aip.org/content/aip/journal/ltp/42/10/10.1063/1.4966244>]

Host: Andrea Cavalleri

