Bogolyubov Kyiv Conference "Problems of Theoretical and Mathematical Physics"

Contribution ID: 12

Type: Oral

Sagnac effect in solids

Thursday, 26 September 2024 10:20 (20 minutes)

The observation of the Sagnac effect for massive material particles offers a significant enhancement in sensitivity when compared to optical interferometers with equal area and angular rotation velocity. For this reason, there have been suggestions to employ solid-state interferometers that rely on semiconductors and graphene. We investigate the Sagnac effect in Dirac materials governed by the relativistic-like quasiparticle dispersion law and show that the fringe shift is still determined by the mass of a free electron. This confirms that graphene is indeed a promising material for creating solid-state Sagnac interferometers. Considering monolayer graphene with its linear dispersion law and comparing it with light provides a deeper understanding of the Sagnac effect.

Primary authors: Mr FESH, Andrii (Kyiv Academic University); Dr SHTANOV, Yuri (Bogolyubov Institute for Theoretical Physics, National Academy of Sciences of Ukraine Astronomical Observatory, Taras Shevchenko National University of Kyiv); Dr SHARAPOV, Sergei (Bogolyubov Institute for Theoretical Physics of the National Academy of Sciences of Ukraine Kyiv Academic University)

Presenter: Dr SHARAPOV, Sergei (Bogolyubov Institute for Theoretical Physics of the National Academy of Sciences of Ukraine Kyiv Academic University)

Session Classification: Morning Session 3

Track Classification: CONDENSED MATTER PHYSICS