Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Quantum oscillations in inverted insulators: gated bilayer graphene SIMONAS GRUBINSKAS, Leiden University, LARS FRITZ, Utrecht University — It was recently demonstrated that a band insulator, i.e., a system without a Fermi surface can exhibit quantum oscillations with well-defined frequencies. We consider a concrete model that has a valence band of the shape of the Goldstone potential which subsequently is subjected to a magnetic field. The quantum oscillations come from the fact that as the magnetic field is varied, different Landau levels come closest to the chemical potential without crossing it. We derive an analytic expression for the Lifshitz-Kosevich formula in such a system and show that the role of 'the area of the Fermi surface' is taken by the area enclosed by the circular minimum of the Goldstone potential. Furthermore, we find that the damping is governed by a complicated interplay of the gap and the finite temperature. We propose to measure this effect in gated bilayer graphene.

Simonas Grubinskas
Leiden University

Date submitted: 11 Nov 2016 Electronic form version 1.4