

Abstract Submitted  
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**Lattice-Induced Double-Valley Degeneracy Lifting in Graphene by a Magnetic Field** I.A. LUK'YANCHUK, University of Picardie, Amiens, 80039 France, A.M. BRATKOVSKY, Hewlett-Packard Labs, California 94304 — We show that the recently discovered double-valley splitting of the low-lying Landau level(s) in the Quantum Hall Effect in graphene can be explained as a *perturbative* orbital interaction of intra- and inter-valley microscopic orbital currents with a magnetic field. This effect is provided by the translationally-non-invariant terms corresponding to graphene's crystallographic honeycomb symmetry but do not exist in the relativistic theory of massless Dirac Fermions in Quantum Electrodynamics. We discuss recent data in view of these results [1]. [1] I.A. Luk'yanchuk and A.M. Bratkovsky, arXiv:0707.0466 (2007)

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