

Abstract Submitted
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Quantum oscillation due to Landau subbands in bulk Ge at room temperature YUHSUKE YASUTAKE, SUSUMU FUKATSU, Graduate School of Arts and Sciences, The University of Tokyo — An electronic system evolves into Landau levels in strong magnetic field at low temperature unless scattering occurs. Here we attempt to observe Landau subbands at room temperature in bulk Ge. Circularly polarized photoluminescence was taken in magnetic fields up to 10 T. Quantum oscillation due to several inter-Landau level transitions in the direct valleys of Ge was clearly observed at 300 K. Individual Landau subbands are resolved as discrete peaks. The $n = 0$ subband showed diamagnetic shifts without optically orientation. Spin relaxation at room temperature is much faster than energy relaxation including intervalley electron-phonon scattering. Interestingly, peak separations smaller than the thermal energy were even observable, which defies the established criterion that Landau levels should develop.

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