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Quantum Oscillations of the Metallic Triangular-Lattice Antiferromagnet $PdCrO_2$ JONG MOK OK, Pohang University of Science and Technology, Y.J. JO, Kyungpook National University, KYOO KIM, Pohang University of Science and Technology, T. SHISHIDOU, Hiroshima University, E.S. CHOI, National High Magnetic Field Laboratory, HAN JIN NOH, Chonnan National University, T. OGUCHI, Osaka University, B.I. MIN, JUN SUNG KIM, Pohang University of Science and Technology — We report the electronic and transport properties of the triangular antiferromagnet $PdCrO_2$ at high magnetic fields up to 33 T, using measurements of the de Haas-van Alphen oscillations and the Hall resistivity. The de Haas-van Alphen oscillations below the magnetic ordering temperature T_N reveal several two-dimensional Fermi surfaces of smaller size than those found in nonmagnetic $PdCoO_2$, consistent with the band structure calculation. This evidences Fermi surface reconstruction due to the 120° helical ordering of the localized Cr spins, suggesting significant coupling of the itinerant electrons to the underlying spin texture. This induces the nonlinear Hall resistivity at low temperatures via the magnetic breakdown in the reconstructed Fermi surface. Furthermore, such a coupling leads to the unconventional anomalous Hall effects near T_N due to the field-induced spin chirality at high magnetic fields.

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