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Hall effect on the triangular lattice[1] GLADYS LEON, CHRISTOPHE BERTHOD, THIERRY GIAMARCHI, DPMC-MaNEP, University of Geneva, 24 quai Ernest-Ansermet, 1211 Geneva 4, Switzerland., ANDREW MILLIS, Department of Physics, Columbia University, 538 West, 120th Street, New York, NY 10027, USA — We investigate the Hall effect on the two-dimensional triangular lattice. We calculate the high frequency Hall constant R_H and its temperature dependence for three regimes of the Hubbard interaction U. In the non-interacting case $U = 0$ we find that R_H behaves at temperature $T = 0$ like the classical dc Hall constant, $R_H \sim 1/ne$. At high T we find a positive R_H increasing linearly with temperature, with a slope depending on the electron density. For small to moderate values of U, we study the effect of interactions on R_H within second-order perturbation theory, and we find these effects to be small. The perturbation theory also shows that the electron self-energy is almost local (k-independent), suggesting the use of a local approximation as the Dynamical Mean Field Theory (DMFT) method to treat higher values of U. We therefore evaluate R_H at large U using both DMFT and the atomic limit of the self-energy, and we compare the results with those obtained at small U. Finally, we discuss the relevance of our calculations for the interpretation of recent Hall measurements in cobaltates.

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