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Zero field Hall effect in chiral p-wave superconductors near the Kosterlitz-Thouless transition CHUN KIT CHUNG, Department of Physics, the University of Tokyo, YUSUKE KATO, Department of Basic Science, the University of Tokyo — A theory of vortex dynamics developed by Ambegaokar, Halperin, Nelson, and Siggia is employed to study two-dimensional chiral p-wave superconducting systems. Due to unequal values of drag coefficients of opposite vorticity specific to chiral p-wave cases, we find that a "convective" term, in addition to diffusivity, should enter the dynamical equations governing vortex pair unbinding process. As a consequence, we find a matrix form dielectric function and a new contribution to Hall conductance σ_{xy} automatically follows even in zero magnetic field. We predict both the Hall conductance and power dissipation show a peak across the Kosterlitz-Thouless transition temperature. Their frequency dependence is also discussed. It is found that a set of frequency-dependent length scales, which controls the truncation of renormalization process, depends on both the convective and diffusive motion of vortices.

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