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**Exchange energy and generalized polarization in the presence of spin-orbit coupling in two dimensions** STEFANO CHESI, GABRIELE F. GIULIANI, Department of Physics, Purdue University — We discuss the concomitant effects of the exchange energy and the spin-orbit interaction in a homogeneous system of interacting electrons in two spatial dimensions. This work extends the mean-field method originally developed in the case of Rashba spin-orbit to a more general form of spin-orbit interaction. The mean-field phase diagram and spin response for a number of representative cases are discussed. Our theory is rigorous in the high-density limit of the paramagnetic phase, where it can be expressed in terms of a generalized fractional electronic polarization. We show that in many cases, the effect of the exchange is to quench, rather than enhance, the generalized polarization induced by the spin-orbit coupling. Our results account qualitatively for the findings of recent experimental investigations.

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