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Mesoscopic Spin Hall Effect PHILIPPE JACQUOD, University of Arizona, INANC ADAGIDELI, University of Regensburg, Germany, JENS BAR-DARSON, University of Leiden, The Netherlands — We investigate the spin Hall effect in ballistic chaotic quantum dots with spin-orbit coupling. We show that a longitudinal charge current can generate a pure transverse spin current. While this transverse spin current is generically nonzero for a fixed sample, we show that when the spin-orbit coupling time is short compared to the mean dwell time inside the dot, it fluctuates universally from sample to sample or upon variation of the chemical potential with a vanishing average. For a fixed sample configuration, the transverse spin current has a finite typical value $\simeq e^2V/h$, proportional to the longitudinal bias V on the sample, and corresponding to about one excess open channel for one of the two spin species. We discuss spin current correlations and noise.

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