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**Experimental technique for the realization of multiple simultaneous Hall effects** RAMESH MANI, Georgia State University — The Hall effect is examined in multiply connected specimens through transport studies of a double-boundary geometry fabricated on two-dimensional (2D) GaAs/AlGaAs heterostructures. The study begins with the identification of a complement of the Hall bar, called the "anti Hall bar," which helps to generate a Hall effect within interior boundaries, when current is passed via interior contacts. Then, a double current technique is applied in an 'anti-Hall bar within a Hall bar' geometry, which includes the above-mentioned 'anti-Hall bar' within the usual Hall bar configuration. The double current experiments show that (i) the Hall effect on a boundary depends only on the current injected via the same boundary, while (ii) the magnetoresistive voltages are insensitive to the origin of the current within the specimen. The experimental results are compared with the recent theoretical modeling of this configuration by Oswald et al. (Phys. Rev. B 72, 035334 (2005)).

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