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Hall Effect Measured Using a Waveguide Tee JOYCE COPPOCK, JAMES ANDERSON, University of Maryland, College Park, Maryland, WILLIAM JOHNSON, Laboratory for Physical Sciences, College Park, Maryland — We describe a simple microwave apparatus to measure the Hall effect in semiconductor wafers. The advantage of this technique is that it does not require contacts on the sample, unlike the Van der Pauw method.[1] Our method consists of placing the semiconductor wafer into a slot cut in an X-band waveguide tee and placing the tee in the center of an electromagnet. The next step is to inject power into two arms of the tee and to balance the output so that no power comes out of the third arm of the tee at zero magnetic field. Application of a nonzero magnetic field gives a Hall signal that is linear in the magnetic field and which reverses phase when the magnetic field is reversed. We use a network analyzer to measure the ratio of the Hall signal to the input power. This method yields the semiconductor mobility in the wafer, which we can compare for calibration purposes with mobility data from our Van der Pauw measurements. This talk presents data for silicon and germanium samples doped with boron or phosphorus. Preliminary measurements on doped III-V semiconductor samples will also be presented.

[1]L. J. van der Pauw, Philips Research Reports **13**, 1 (1958)

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