where ρ is the sample resistivity in ohm-cm, V is the potential drop measured across the two voltage probes in volts, I is the current passing through the two current probes in amperes, t is the sample thickness in cm, and F_3 is the correction factor given in table III. Factor F_3 applies when, in Figure 3, either the pair of probes 1 and 2 or the pair of probes 3 and 4 is being used to pass current, with the remaining pair of probes being used as voltage probes.

F_3 is given as a function of the dimensionless parameters s over r and Δ over r, where s is the probe spacing, r is the sample radius and Δ is the probe displacement. A sub-table is given for each value of s over r from 0.01 to 0.70 in steps of 0.01. Each sub-table gives the value of F_3 for values of Δ over r from 0.00 to 0.99 in steps of 0.01. For example, when s over r is 0.02 and Δ over r is 0.81, F_3 is 9.02097. Where the value 0. appears in the table for F_3, the value of Δ over r is such that the probe is no longer completely on the sample.

CALCULATIONS

The formulas used to calculate F_1, F_2, and F_3 are given elsewhere[3,5] and are listed below for reference.

$$F_1 = \left(\frac{\pi}{\ln 2}\right)\left(\frac{1}{1+\eta_1}\right)$$

where

$$\eta_1 = \frac{1}{2 \ln 2} \ln \frac{\left[1 - \left(\frac{\Delta}{r} + \frac{s}{2r}\right)\left(\frac{\Delta}{r} - \frac{3s}{2r}\right)\right]\left[1 - \left(\frac{\Delta}{r} - \frac{s}{2r}\right)\left(\frac{\Delta}{r} + \frac{3s}{2r}\right)\right]}{\left[1 - \left(\frac{\Delta}{r} - \frac{s}{2r}\right)\left(\frac{\Delta}{r} - \frac{3s}{2r}\right)\right]\left[1 - \left(\frac{\Delta}{r} - \frac{s}{2r}\right)\left(\frac{\Delta}{b} + \frac{3s}{2r}\right)\right]} \quad (4)$$

$$F_2 = \left(\frac{\pi}{\ln 2}\right)\left(\frac{1}{1+\eta_2}\right)$$

where

$$\eta_2 = \frac{1}{2 \ln 2} \ln \frac{\alpha_1 \alpha_2}{4 \alpha_3 \alpha_4}$$

$$\alpha_1 = (V_2 - V_1)^2 + (U_1 + U_2)^2$$

$$\alpha_2 = (V_2 + V_1)^2 + (U_1 + U_2)^2$$

$$\alpha_3 = (V_2 - V_1)^2 + (U_2 - U_1)^2$$

$$\alpha_4 = (V_2 + V_1)^2 + (U_2 - U_1)^2$$