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Correction to EM Laboratory Scientific Report No. 40: The Use of Effective Aperture Relations for the Calculation of the Input Conductance of electrically Small Antenna

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Correction to Scientific Report #40

THE USE OF EFFECTIVE APERTURE RELATIONS FOR THE
CALCULATION OF THE INPUT CONDUCTANCE OF ELECTRICALLY
SMALL ANTENNA

by

David C. Chang and Lawrence W. Rispin

In Section IV, the result of the integration using (9) for $I_R(\theta; z)$ in (5) leading to (10) for G_A has been incorrectly stated. The correct result for the input conductance of an electrically short ($kh \lesssim 1$) cylindrical antenna is given by

$$G_A = \eta \frac{k^2}{6\pi} |I^R(\pi/2, z)|^2 \quad (11)$$

Numerically, the above formula differs from the original eq. (10) by ~ -17%. A corrected Figure 3 is included which shows (11) to predict conductance values very close to the numerically integrated results using (5) with (8). Hence the simple expression above does not agree as well as the original incorrect eq. (10) with the conductance data of King [1, Chap. II, Sec. 32] for the smaller values of kh but substantially better agreement is obtained at the larger values of kh .

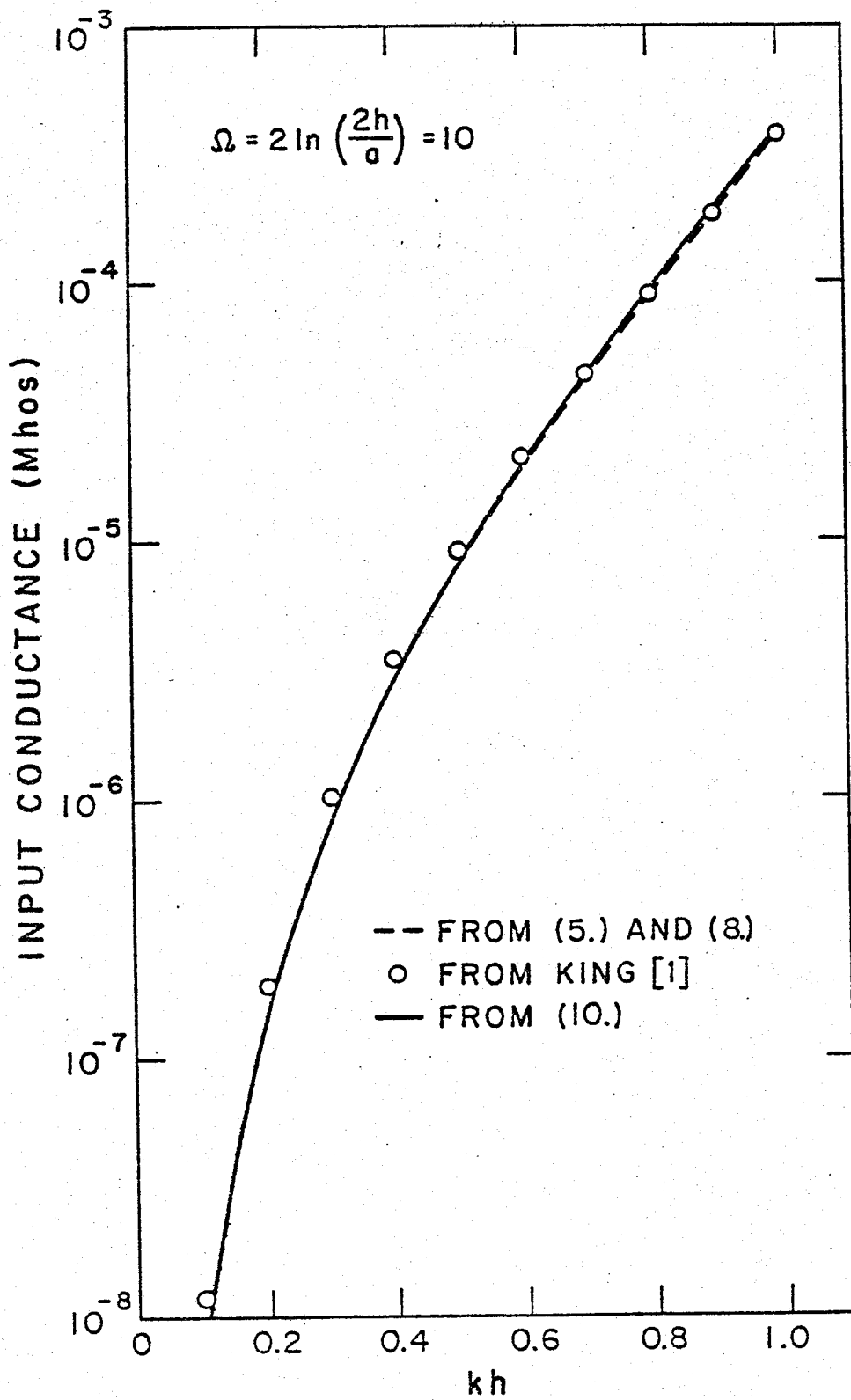


Figure 3. The input conductance of a short cylindrical antenna in which $\Omega = 2 \ln(2h/a) = 10.0$.