Journal of Ultrasond in Medicine 8, 653-654, 1989

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$$1^\circ \text{ power} = 23 \times D/f \tag{1}$$

It was explained in AIUM 1988 that this formula is conservative in that computations based on it always give values for the 1° power that are equal to or less than the entries in AIUM Table 2.3 (which are themselves conservative). Specifically, it was found that Equation 1 gives values for the 1° power that are less than the entries in AIUM Table 2.3 by percentages varying from 2% to 65%.

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Another empirical formula was tested and found to be more satisfactory for small values of D. By analogy to Equation 1 it is written

$$1^\circ \text{ power} = 75 \times \sqrt{D}/f \tag{2}$$

where, again, the 1° power is in milliwatts, D in millimeters, and f in megahertz. Comparisons were made between computations based on Equation 2 and entries in the above-mentioned extension to AIUM Table 2.3; the new entries are based on the same algorithm as before, but include values for diameters varying from 0.4 to 20 mm. It was found that calculations of 1° power from Equation 2 are less than corresponding tabulated values by percentages varying from 6% to 100%. Thus Equation 2 is conservative, but (at small values of D) not nearly as much as Equation 1.

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