In addition, MRB requires an additional adjustment of tuning the measured resonator for its resonant frequency to coincide with that of the reference one. This adjustment seems difficult because, as shown in Fig. 5, tuning broadens the output response of MRB. Therefore, there is a possible error source due to detuning. The discussion of errors lacks for this amount.

In conclusion, it is doubtful whether MRB provides better sensitivity than the bridge in [2]. The only advantage of MRB is that, as pointed out in the concluding section, it may compensate for the temperature drift of the parameters of the measured resonator.

References

[1] K. Watanabe and I. Takao, "A bridge method for simultaneous measurements of coupling coefficient and loaded Q of a single-ended cavity," *Rev. Sci. Instrum.*, vol. 44, pp. 1625–1627, Nov. 1973.

[2] K. Watanabe, M. Ashiki, S. Mizushina, and I. Takao, "Accurate determination of microwave conductivity by means of cavity coupling coefficient measurement," *Japan. J. Appl. Phys.*, vol. 14, pp. 909–910, June 1975.

Reply[2] by Ivan Kneppo and Michal Weis[3]

The replacement of the reference load consisting of a shutter and matched termination by a reference resonator has these advantages:

1) The change in relative output power ($|b_4'|/|b_4|$) produced by the MRB is larger than the change of the original bridge. This relative sensitivity increases as the difference between the coupling coefficients of the reference and measured resonators decreases. As for the MRB output signal measurement it is true that the RF substitution technique is not optimal from the standpoint of full exploitation of the sensitivity provided by the MRB. It appears more convenient to use a calibrated detector followed by a differential amplifier which allow us to compensate the zero signal of the MRB or to use a measuring microwave receiver, respectively.

2) The response of the MRB: the output power versus frequency, contains also some additional information about another parameter of the measured resonator namely, about the loaded quality factor. For example, from integral of the MRB response it is possible to obtain the relation for calculation of the loaded Q and the change of Q due to the sample inserted into the measured resonator. It is matter of fact, that such measuring of the quality factor is a comparative one, and also has an advantage of high sensitivity.

3) MRB gives also the information about the difference in tuning of the measured and reference resonators and allows us to tune the resonators exactly to the same resonance frequency. Then, the measuring method permits measurement of all three parameters of the measured resonator without any circuit rearrangement. Of course, the detuning represents an error source that can be diminished, e.g., by the use of the electrically tuned reference (or measured) resonator connected in the control loop, which automatically tunes the resonator to the minimal output power of MRB.

[2]Manuscript received October 3, 1977.

[3]The authors are with Elektrotechnický ústav SAV, Dúbravská cesta 9, 809 32 Bratislava, Czechoslovakia.

Correction to "Input Impedance of Coaxial Line to Circular Waveguide Feed"

N. D. DESHPANDE AND B. N. DAS

In the above paper[1] the expression (8) in Section IV should read as

$$|\Gamma| = \frac{\sqrt{[(\gamma_{in}-1)^2 + x_{in}^2]}}{\sqrt{[(\gamma_{in}+1)^2 + x_{in}^2]}}. \tag{8}$$

Manuscript received October 15, 1977.

The authors are with Department of Electronics and Electrical Communication Engineering, Indian Institute of Technology, Kharagpur 721302, India.

[1]M. D. Deshpande and B. N. Das, *IEEE Trans. Microwave Theory Tech.*, vol. MTT-25, pp. 954–957, Nov. 1977.

Correction to "Optimization of the Matching Network for a Hybrid Coupler Phase Shifter"

J. PIOTR STARSKI

In the above paper,[1] the manuscript received date was printed incorrectly. The date should have read, Manuscript received August 16, 1976.

Manuscript received September 21, 1977.

The author is with Chalmers University of Technology, Division of Network Theory, Gothenburg, Sweden.

[1]J. P. Starski, *IEEE Trans. Microwave Theory Tech.*, vol. MTT-25, pp. 662–666, Aug. 1977.