Letters

Comments on "Microwave Filters of Parallel-Cascade Structure"

R. Finkler and R. Unbehauen

In the above paper [1], Osipenkov and Vesnin show how a parallel connection of two four-poles (incorrectly termed four-port networks by them) can be used to implement a (microwave) filter. They start from the assertion that the chain matrix $[A]$ of the parallel connection can be calculated from the chain matrices $[A']$ and $[A'']$ of the single four-poles by means of (2) of [1]. This assertion is equivalent to the statement that the admittance matrix of the parallel connection is the sum of the admittance matrices of the single four-poles. Nevertheless, this statement is not true for all pairs of four-poles, but only under certain conditions (see e.g., [2]), e.g., if the four-poles act as two-ports in the parallel connection in the sense that $I'_{1a} + I'_{1b} = I'_{2a} + I'_{2b} = I''_{1a} + I''_{1b} = I''_{2a} + I''_{2b} = 0$, where with respect to Fig. 1 of [1] I'_{1a} (I'_{1b}, I'_{2a}, I'_{2b}) denotes the current into the upper left (lower left, upper right, lower right) terminal of the

four-pole with chain matrix $[A']$ and I''_{1a}, I''_{1b}, I''_{2a}, I''_{2b} denote the corresponding currents for the four-pole with chain matrix $[A'']$.

Possibly, these conditions are satisfied in the realizations presented in [1]. But, as in many other texts of other authors (e.g., [3, p. 229] and [4, Section II-11, p. 59]), a hint that such conditions must be satisfied is missing. We concede that the parallel connection of Fig. 1 of [1] may be used as a filter implementation even if the aforesaid conditions are not satisfied. But in this case, the analysis cannot be carried out by (2) of [1]; instead, e.g., analysis techniques provided in [2] could be applied.

Of course, the content of these comments is trivial. Nevertheless, we feel that it is advisable to make these comments both for the sake of completeness and to prevent readers from being misled.

REFERENCES

[1] V. M. Osipenkov and S. G. Vesnin, "Microwave filters of parallel-cascade structure," IEEE Trans. Microwave Theory Tech., vol. 42, pp. 1360–1367, July 1994.

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