TABLE I
THE OPTIMAL FINE MODEL DESIGN AND THE CORRESPONDING EXTRACTED COARSE MODEL POINT FOR THE TWO-SECTION WAVEGUIDE TRANSFORMER

Parameter	$\boldsymbol{x}_{em}^{*}$	$\overline{\boldsymbol{x}}_{os}$
b_1	0.71737	0.71468
b_2	1.39574	1.39092
L_1	1.55077	1.64691
L_2	1.50654	1.59799

all values are in cm

TABLE II
THE YIELD FOR THE TWO-SECTION WAVEGUIDE TRANSFORMER OBTAINED USING THE SDM STATISTICAL ANALYSIS COMPARED WITH FINE MODEL YIELD

Tolerance	Space-Mapped Yield	Fine Model Yield
1.0%	59%	53%
2.0%	27%	19%
4.0%	8%	3%

TABLE III
THE OPTIMAL FINE MODEL DESIGN AND THE CORRESPONDING EXTRACTED COARSE MODEL POINT FOR THE THREE-SECTION WAVEGUIDE TRANSFORMER WITH ROUNDED CORNERS

Parameter	$\boldsymbol{x}_{em}^{*}$	$\overline{\boldsymbol{x}}_{os}$
L_1	0.32408	0.32507
L_2	0.32492	0.32747
L_3	0.33114	0.33223
h_1	0.20750	0.21543
h_2	0.26025	0.27415
h_3	0.32815	0.33700

All values are in inches

TABLE IV
THE OPTIMAL FINE MODEL DESIGN AND THE CORRESPONDING EXTRACTED COARSE MODEL POINT FOR THE SIX-SECTION WAVEGUIDE FILTER

Parameter	$\boldsymbol{x}_{em}^{*}$	$\overline{\boldsymbol{x}}_{os}$
C_1	0.51336	0.49956
C_2	0.47293	0.45926
C_3	0.45031	0.43709
C_4	0.44575	0.43274
L_1	0.63570	0.65468
L_2	0.63910	0.65873
L_3	0.65681	0.67579

All values are in inches

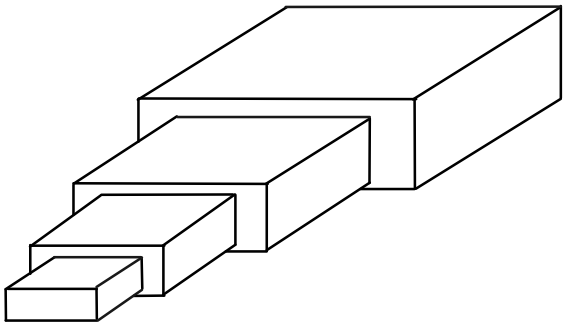

Fig. 1. The two-section waveguide transformer.

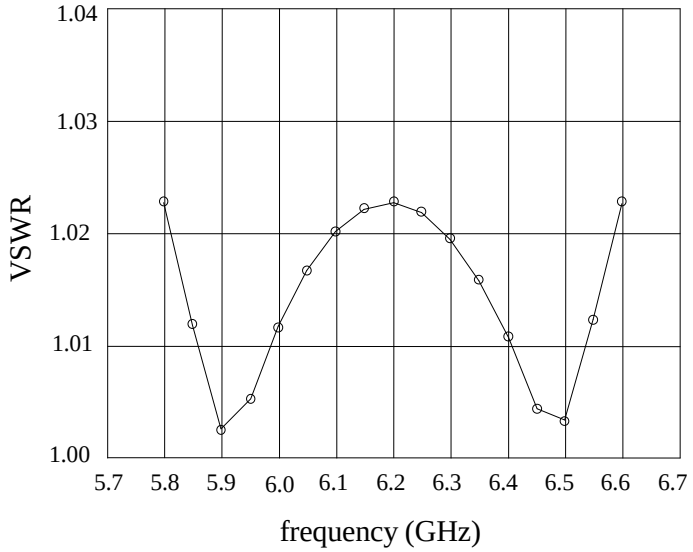

Fig. 2. The optimal fine model response (o) and the response (—) at the corresponding coarse model point for the two-section waveguide transformer.

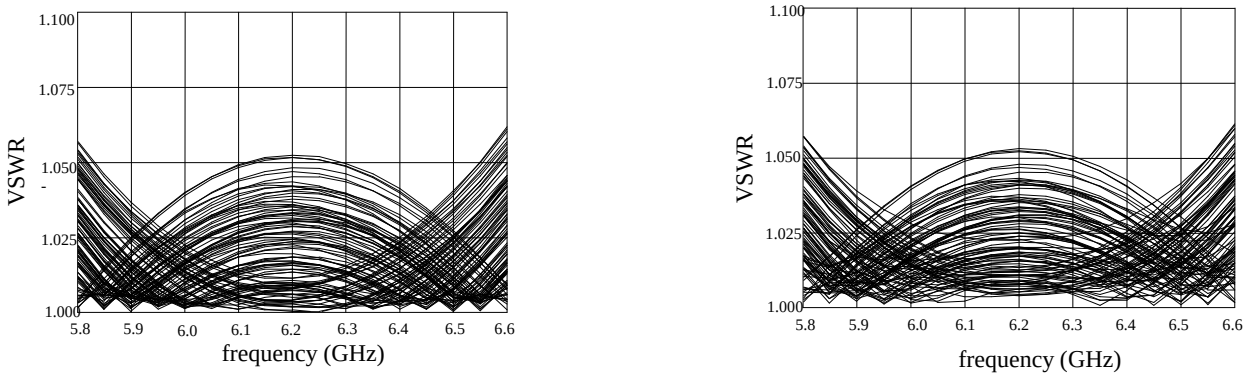

Fig. 3. Statistical analysis for the two-section waveguide transformer assuming uniform distribution with relative tolerances of 1.0%, (a) using the SDMM, and (b) using fine model simulations.

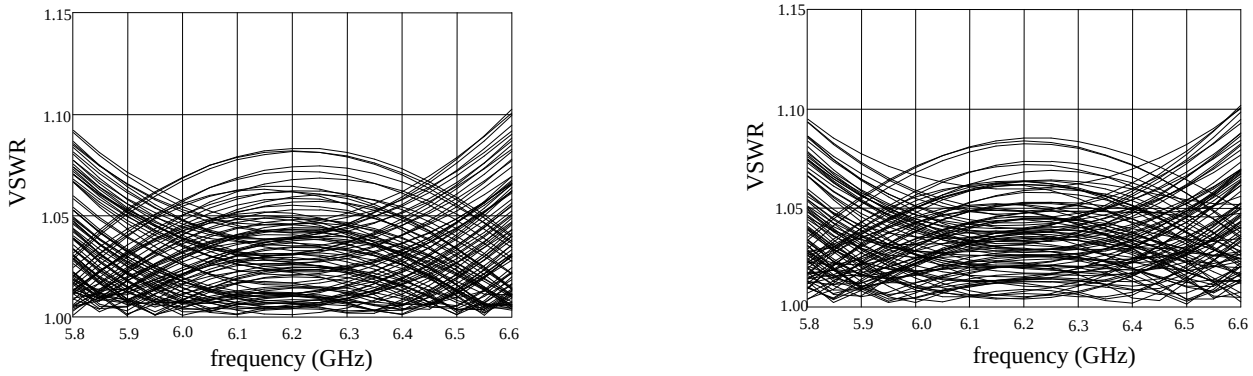

Fig. 4. Statistical analysis for the two-section waveguide transformer assuming uniform distribution with relative tolerances of 2.0%, (a) using the SDMM, and (b) using fine model simulations.

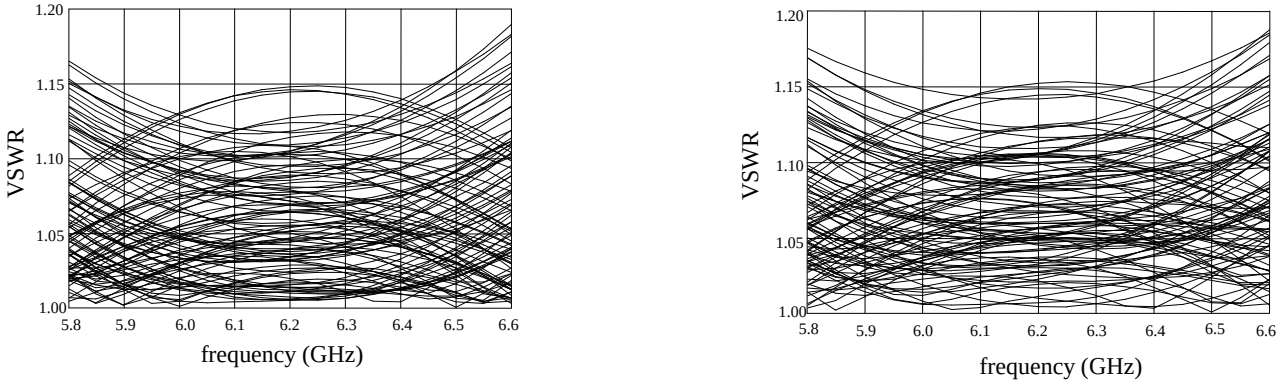

Fig. 5. Statistical analysis for the two-section waveguide transformer assuming uniform distribution with relative tolerances of 4.0%, (a) using the SDMM, and (b) using fine model simulations.

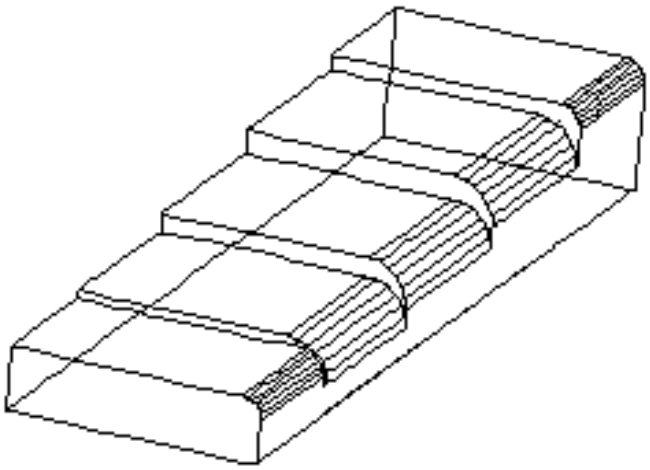

Fig. 6. The simulated part of the three-section waveguide transformer with rounded corners [6].

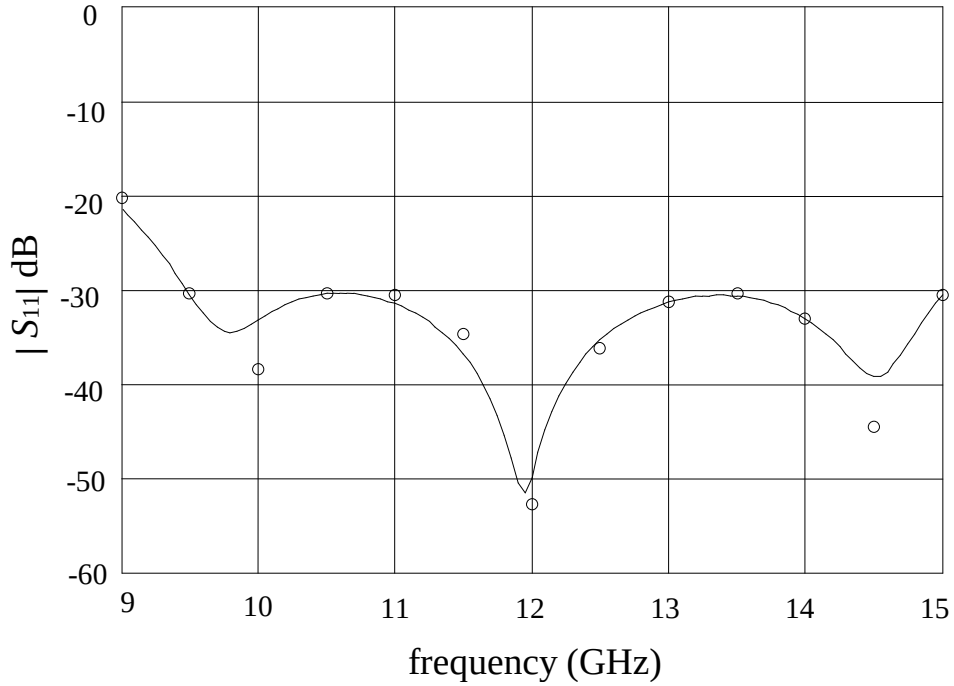

Fig. 7. The optimal fine model response (o) and the response (—) at the corresponding coarse model point for the three-section waveguide transformer with rounded corners.

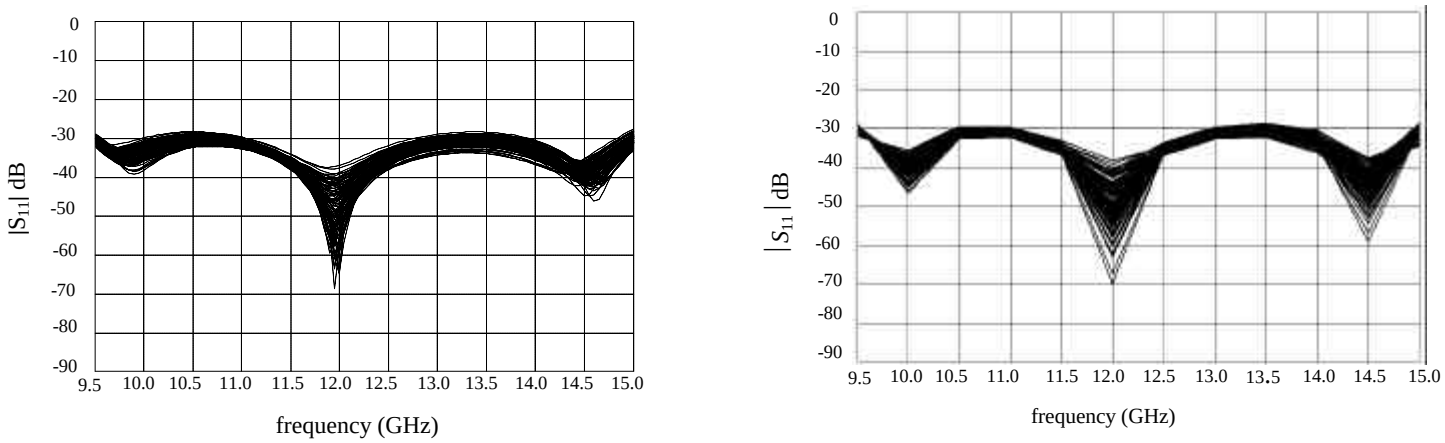

Fig. 8. Statistical analysis for the three-section waveguide transformer assuming uniform distribution with relative tolerances of 0.5%, (a) using the SDMM, and (b) using fine model simulations.

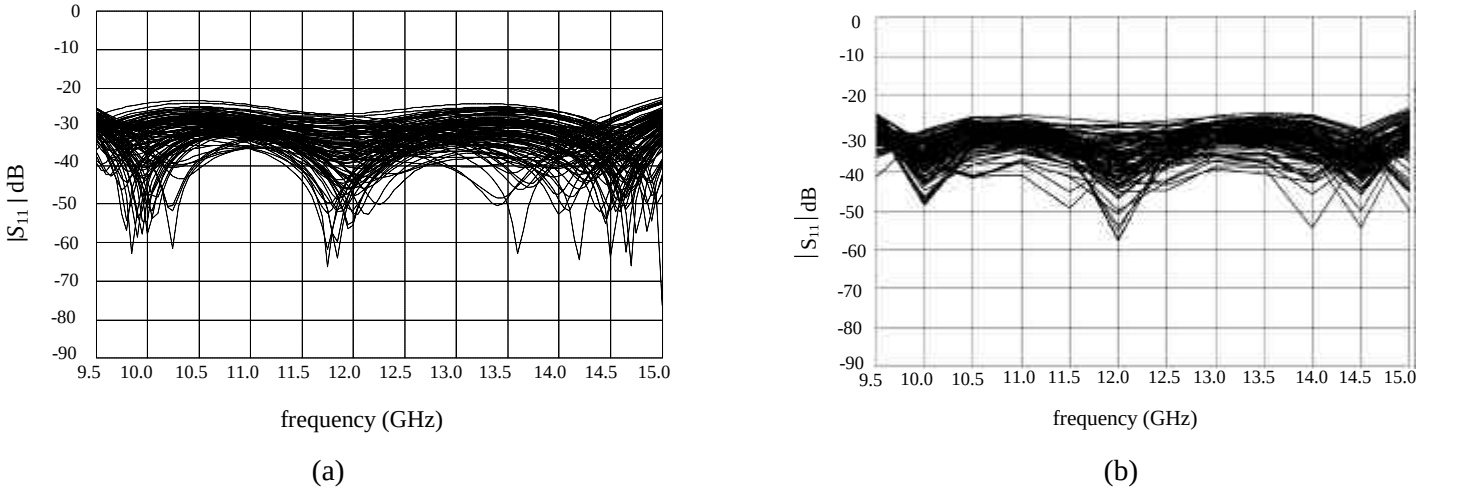

Fig. 9. Statistical analysis for the three-section waveguide transformer assuming uniform distribution with relative tolerances of 2%, (a) using the SDMM, and (b) using fine model simulations.

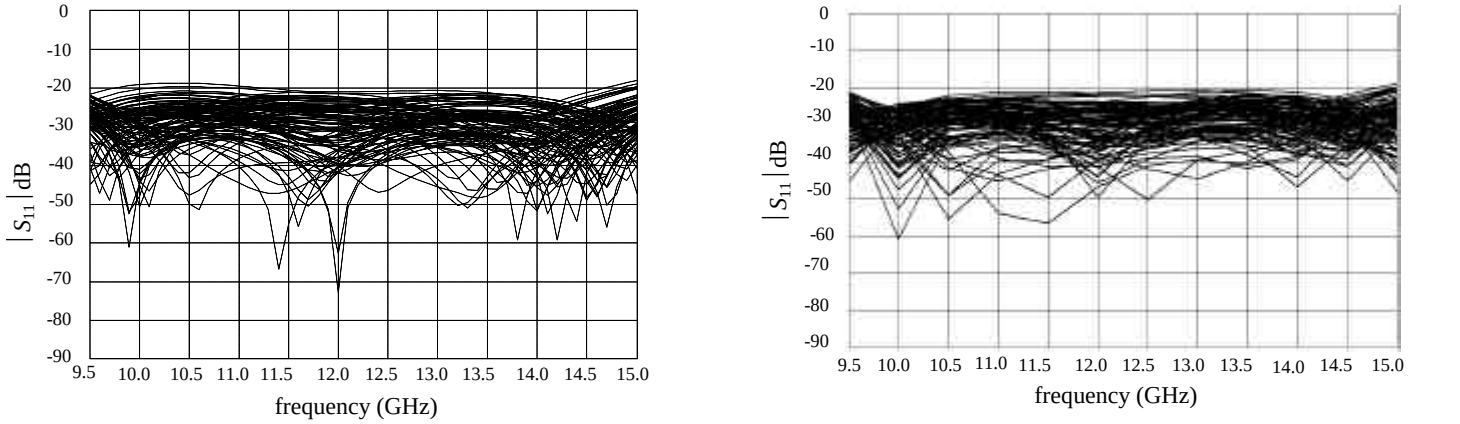

Fig. 10. Statistical analysis for the three-section waveguide transformer assuming uniform distribution with relative tolerances of 4%, (a) using the SDMM, and (b) using fine model simulations.

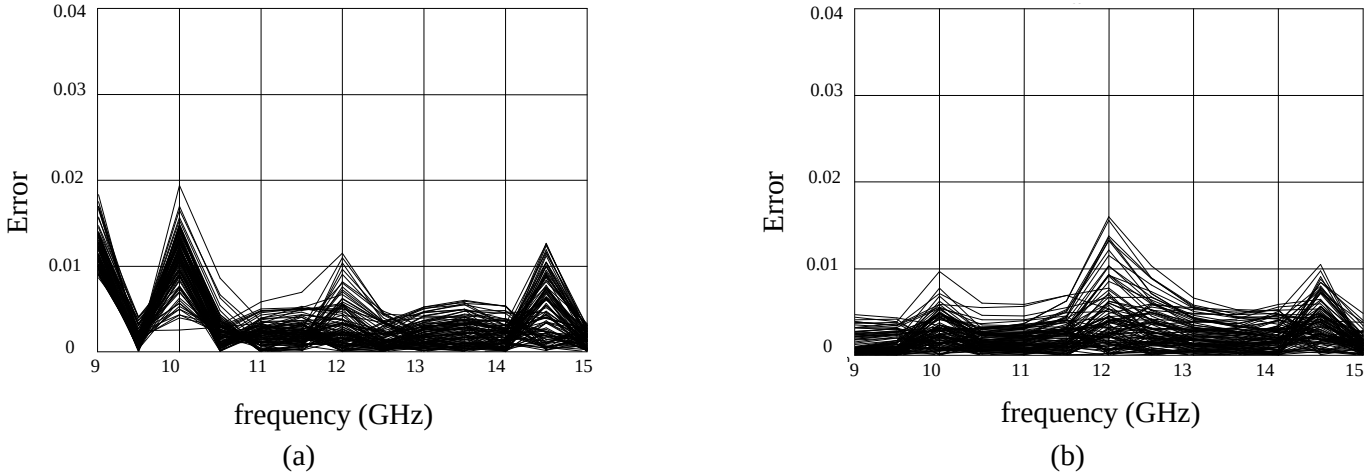

Fig. 11. Error in the statistical analysis for the three-section waveguide transformer assuming uniform distribution with relative tolerances of 0.5%, (a) using SDMM, and (b) using linear approximation.

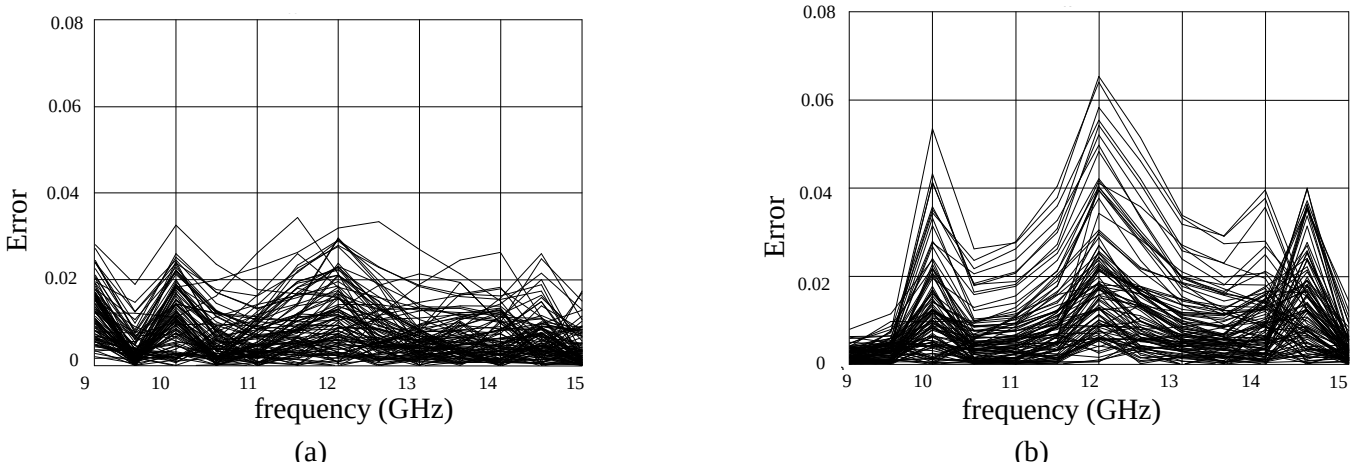

Fig. 12. Error in the statistical analysis for the three-section waveguide transformer assuming uniform distribution with relative tolerances of 2%, (a) using SDMM, and (b) using linear approximation.

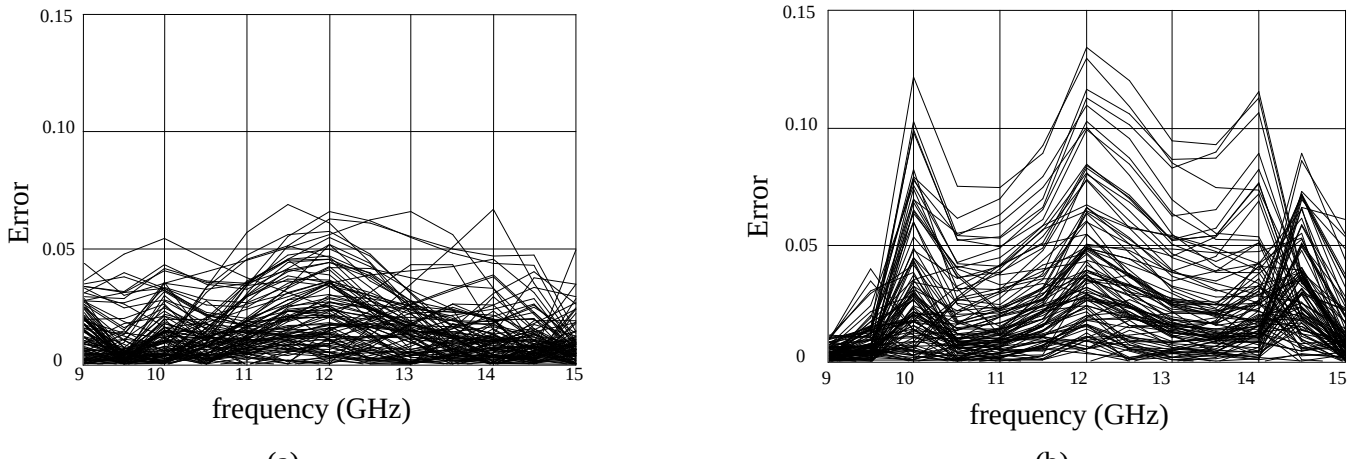

Fig. 13. Error in the statistical analysis for the three-section waveguide transformer assuming uniform distribution with relative tolerances of 4%, (a) using SDMM, and (b) using linear approximation.

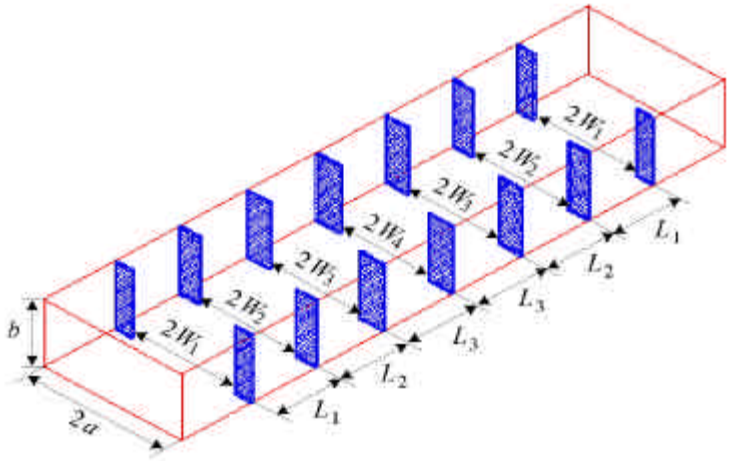

Fig. 14. The fine model of the six-section waveguide filter [11, 12].

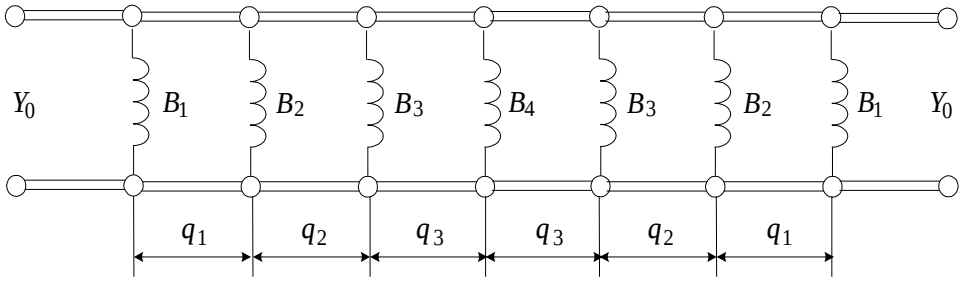

Fig. 15. The coarse model of the six-section waveguide filter [13].

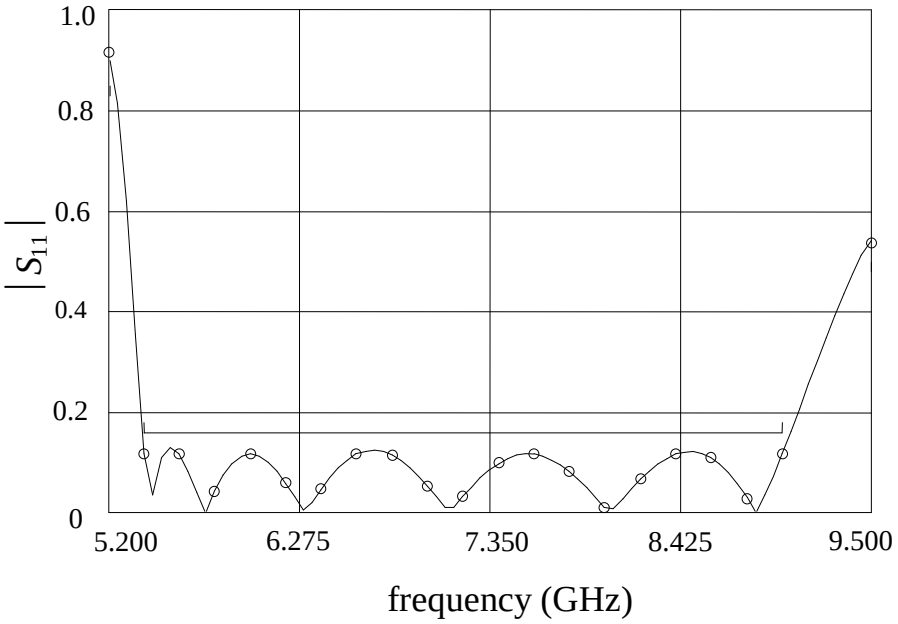

Fig. 16. The fine model response (o) and the response (—) at the extracted coarse model point for the six-section waveguide filter.

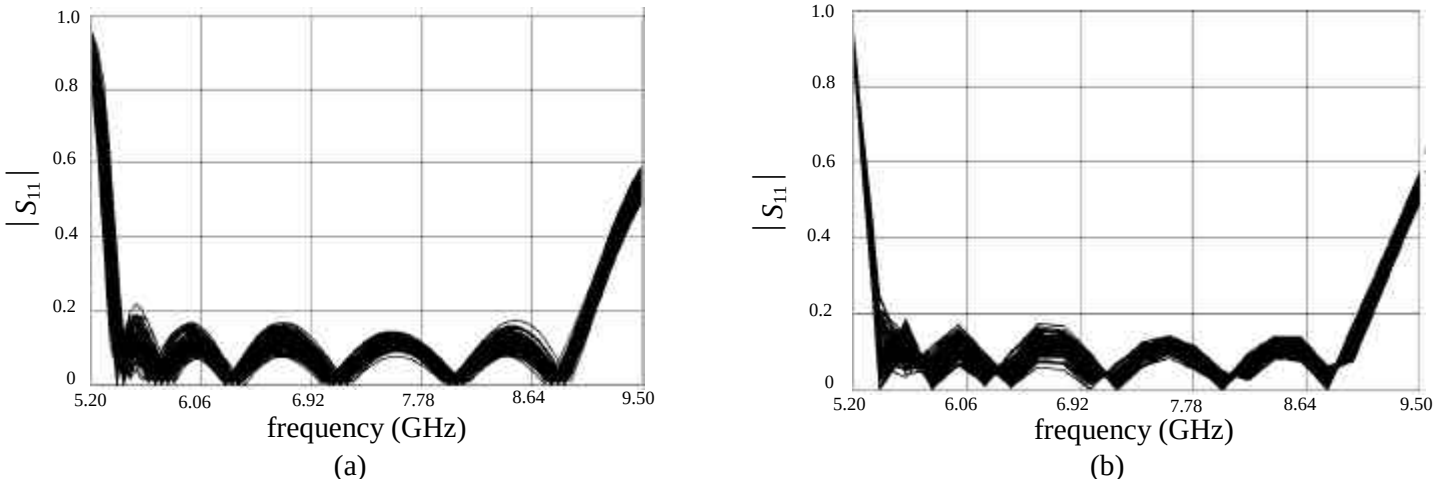

Fig. 17. Statistical analysis for the six-section waveguide filter assuming uniform distribution with relative tolerances of 1%, (a) using the SDMM, and (b) using fine model simulations.

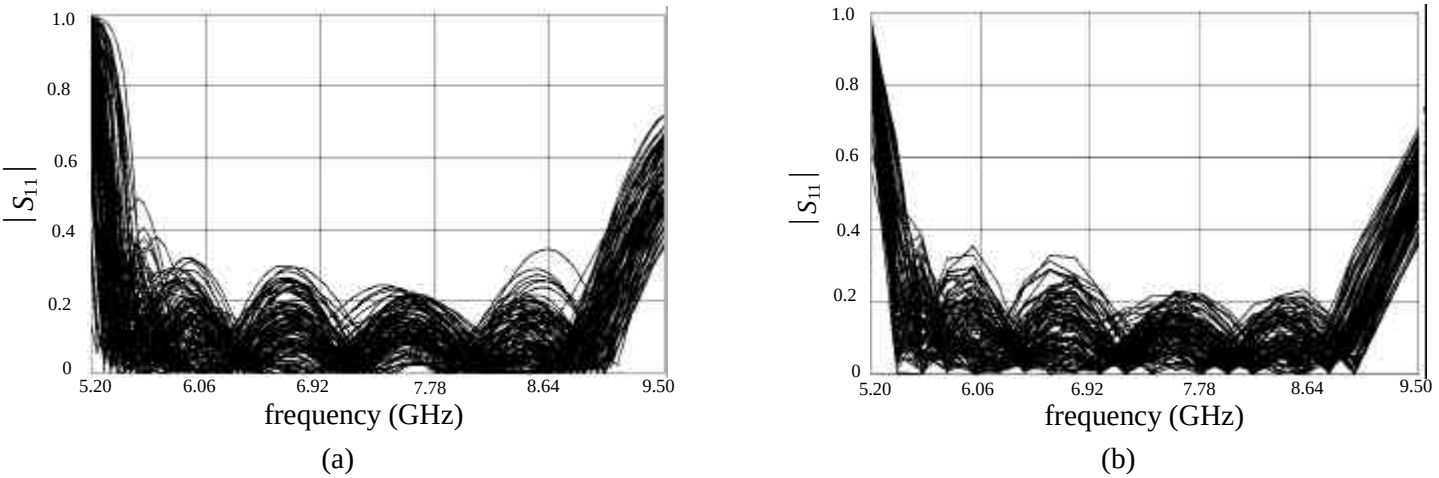

Fig. 18. Statistical analysis for the six-section waveguide filter assuming uniform distribution with relative tolerances of 4%, (a) using the SDMM, and (b) using fine model simulations.

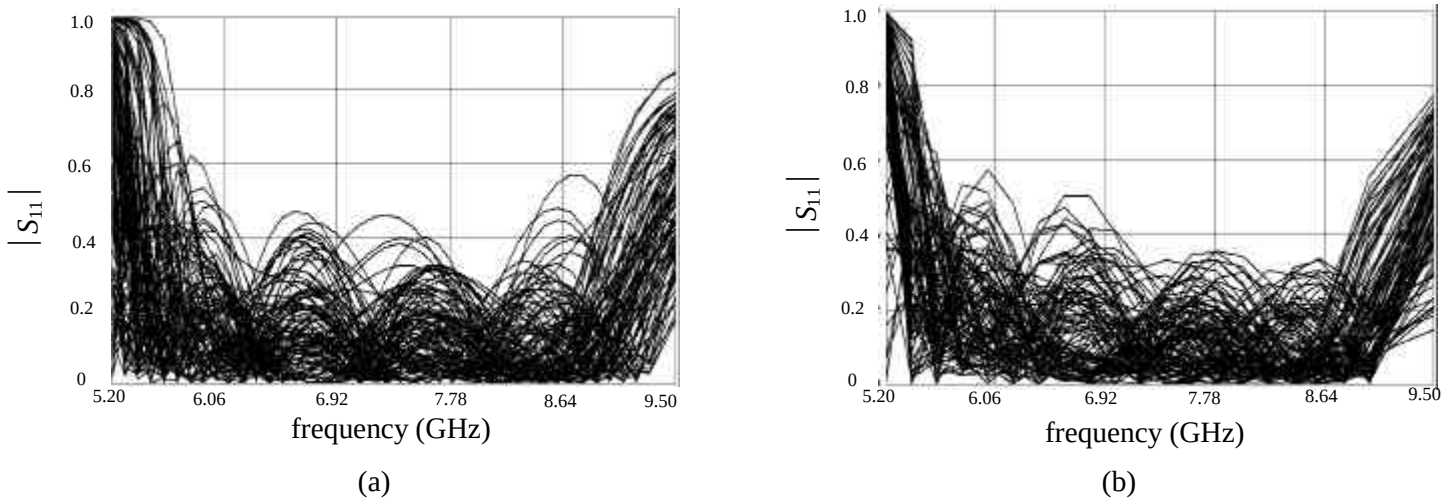

Fig. 19. Statistical analysis for the six-section waveguide filter assuming uniform distribution with relative tolerances of 8%, (a) using the SDMM, and (b) using fine model simulations.

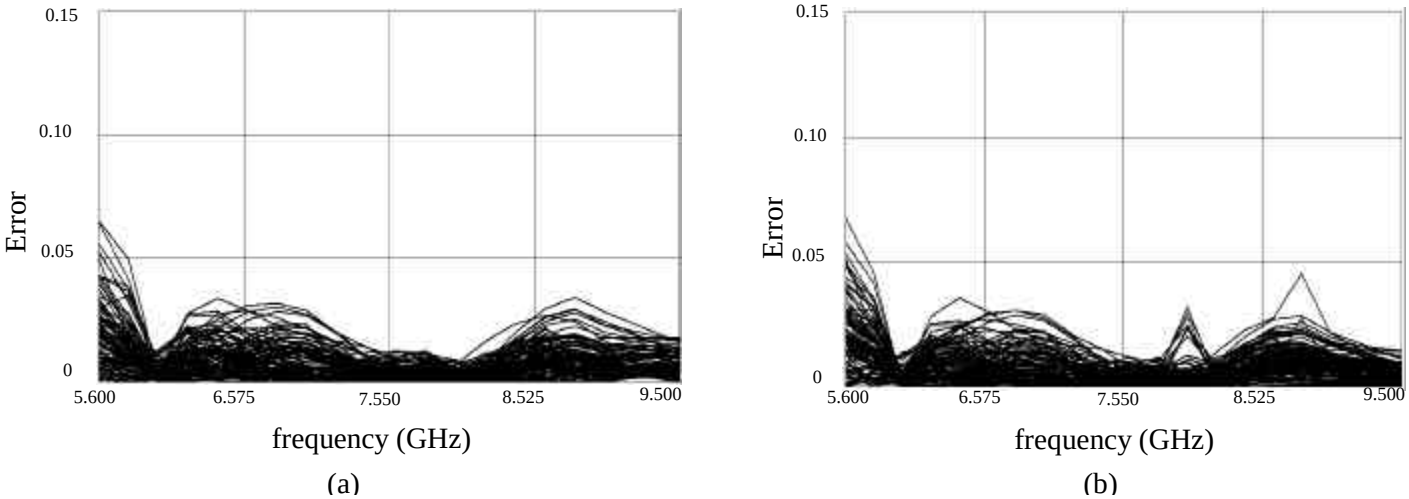

Fig. 20. Error in the statistical analysis for the six-section waveguide filter assuming uniform distribution with relative tolerances of 1%, (a) using SDMM, and (b) using linear approximation.

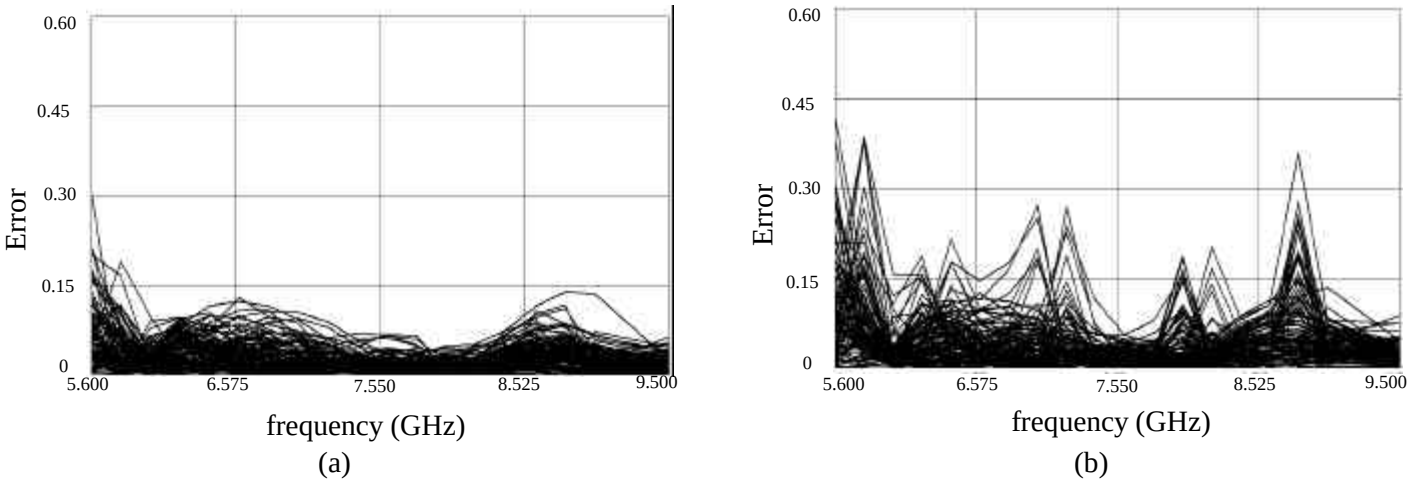

Fig. 21. Error in the statistical analysis for the six-section waveguide filter assuming uniform distribution with relative tolerances of 4%, (a) using SDMM, and (b) using linear approximation.

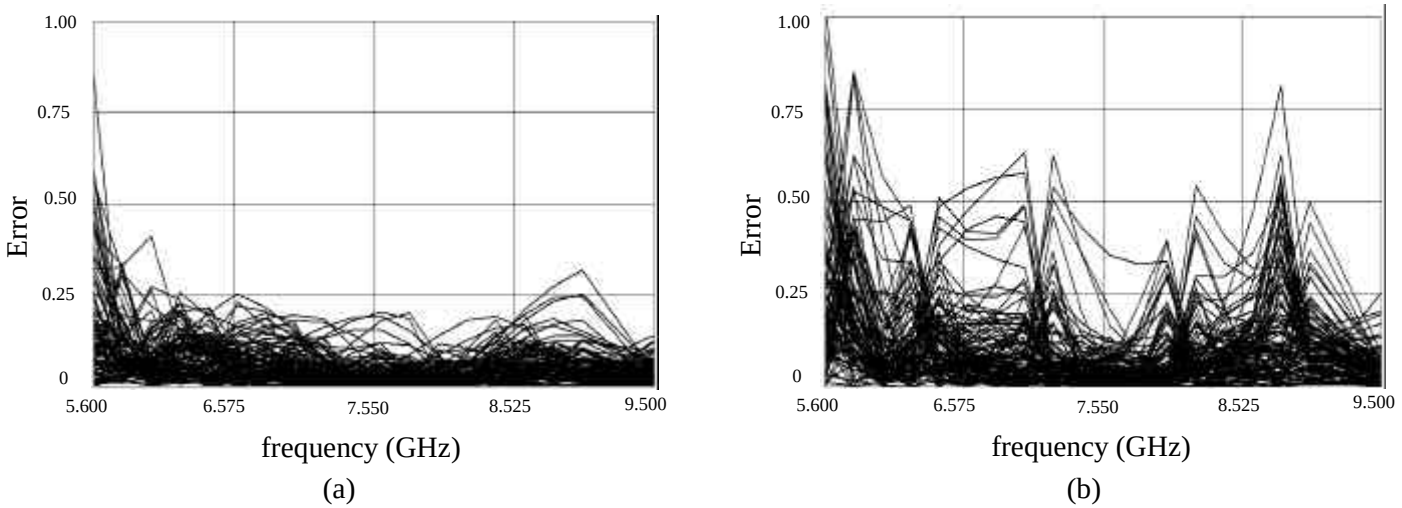

Fig. 22. Error in the statistical analysis for the six-section waveguide filter assuming uniform distribution with relative tolerances of 8%, (a) using SDMM, and (b) using linear approximation.