TABLE I
THE VARIATION IN THE EXTRACTED PARAMETERS
FOR THE 10:1 IMPEDANCE TRANSFORMER

Number of Points	$x^e_{os,1}$	$x^e_{os,2}$
1	3.62043	7.24147
2	3.47160	7.43214
3	3.60357	7.35052

TABLE II
MATERIAL AND PHYSICAL PARAMETERS
FOR THE COARSE AND FINE MODELS OF THE HTS FILTER

Model Parameter	Coarse Model	Fine Model
substrate dielectric constant	23.425	23.425
substrate thickness (mil)	19.9516	19.9516
shielding cover height (mil)	100	250
conducting material thickness	0	0
substrate dielectric loss tangent	0	0
resistivity of metal (Ωm)	0	0
magnetic loss tangent	0	0
surface reactance (Ω/sq)	0	0
x-grid cell size (mil)	2.00	1.00
y-grid cell size (mil)	1.75	1.75

TABLE III
THE OPTIMAL COARSE MODEL DESIGN
FOR THE HTS FILTER

Parameter	Value
L_1	181.00
L_2	201.59
L_3	180.97
S_1	20.12
S_2	67.89
S_3	66.85

all values are in mils

TABLE IV
THE FINE MODEL POINTS USED IN THE APE ALGORITHM FOR THE HTS FILTER

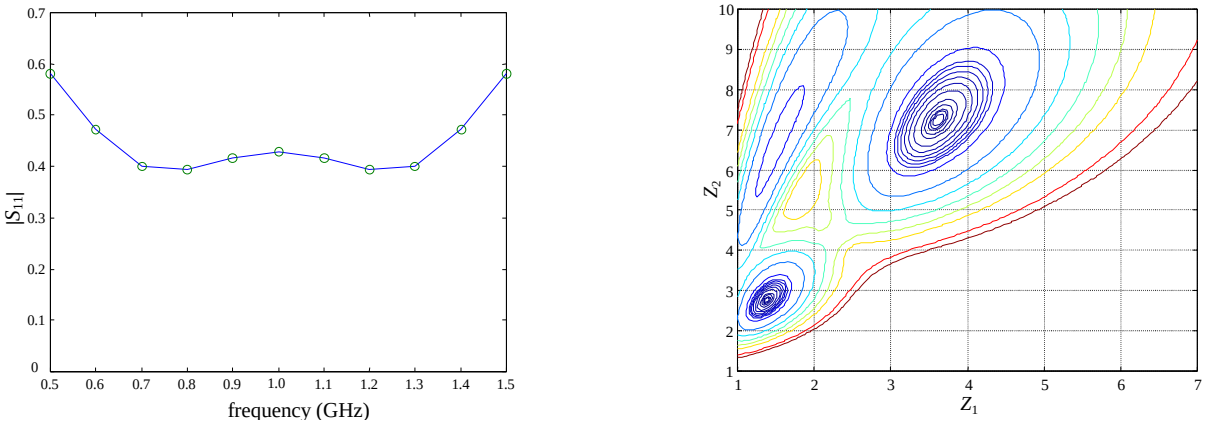
Parameter	$\boldsymbol{x}_f^{(1)}$	$\boldsymbol{x}_f^{(2)}$	$\boldsymbol{x}_f^{(3)}$	$\boldsymbol{x}_f^{(4)}$
L_1	181.00	182.55	181.34	179.86
L_2	201.59	205.64	205.38	197.74
L_3	180.97	183.36	184.20	178.08
S_1	20.12	20.05	20.07	20.46
S_2	67.89	68.40	68.08	67.35
S_3	66.85	67.25	66.98	66.46

all values are in mils

TABLE V
THE VARIATION IN THE EXTRACTED PARAMETERS FOR THE HTS FILTER

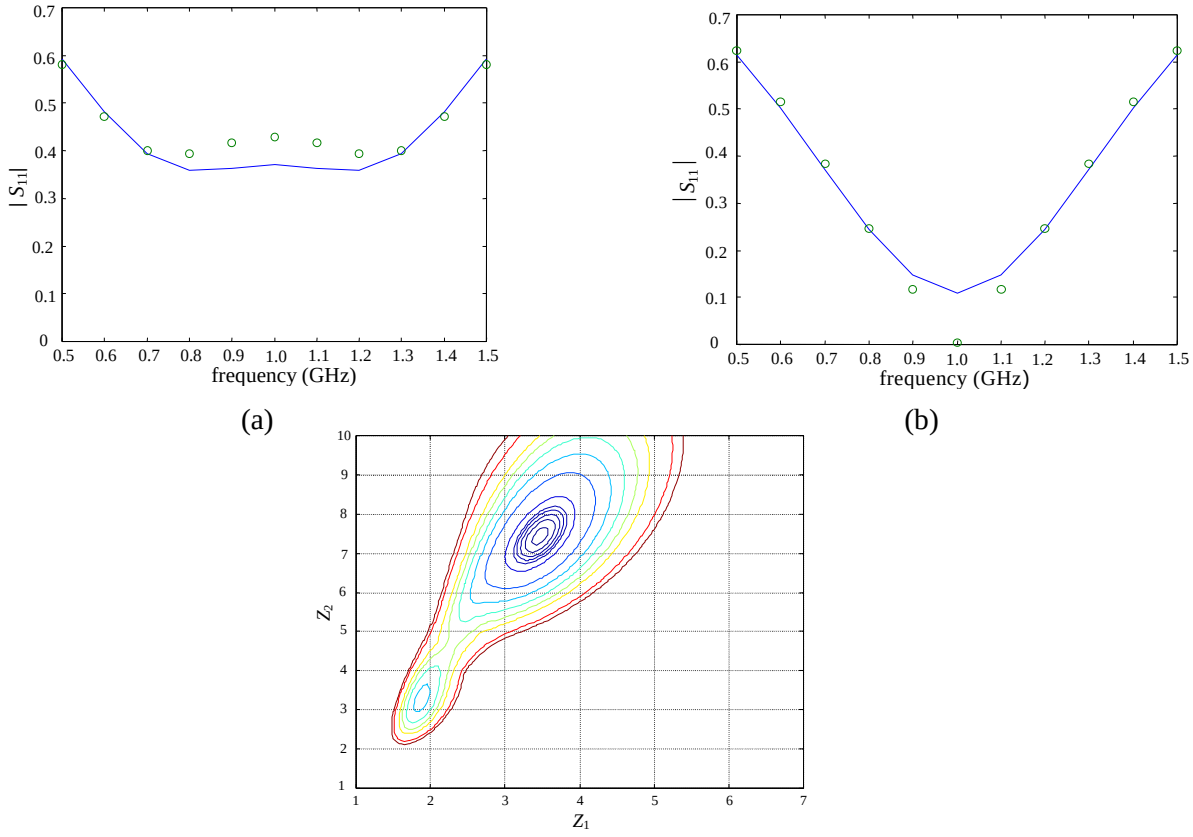
Parameter	1	2	3	4
L_1	188.31	179.99	176.67	178.50
L_2	197.69	204.52	208.52	206.78
L_3	189.72	181.230	178.00	179.09
S_1	19.34	17.13	17.21	18.99
S_2	52.67	63.44	56.52	57.99
S_2	52.67	63.44	56.52	57.99
S_3	52.06	53.18	53.47	56.77

all values are in mils



(a) (b)

Fig. 1. Results for single point parameter extraction for the 10:1 transformer, (a) the responses at the fine model point (o) and the response (–) at the corresponding coarse model point, and (b) the corresponding contours of the ℓ_2 objective function.



(a) (b)

(c)

Fig. 2. Results for two-point parameter extraction for the 10:1 transformer, (a) and (b) the responses at the first and second fine model points (o) and the responses (–) at the corresponding coarse model points, and (c) the corresponding contours of the ℓ_2 objective function.

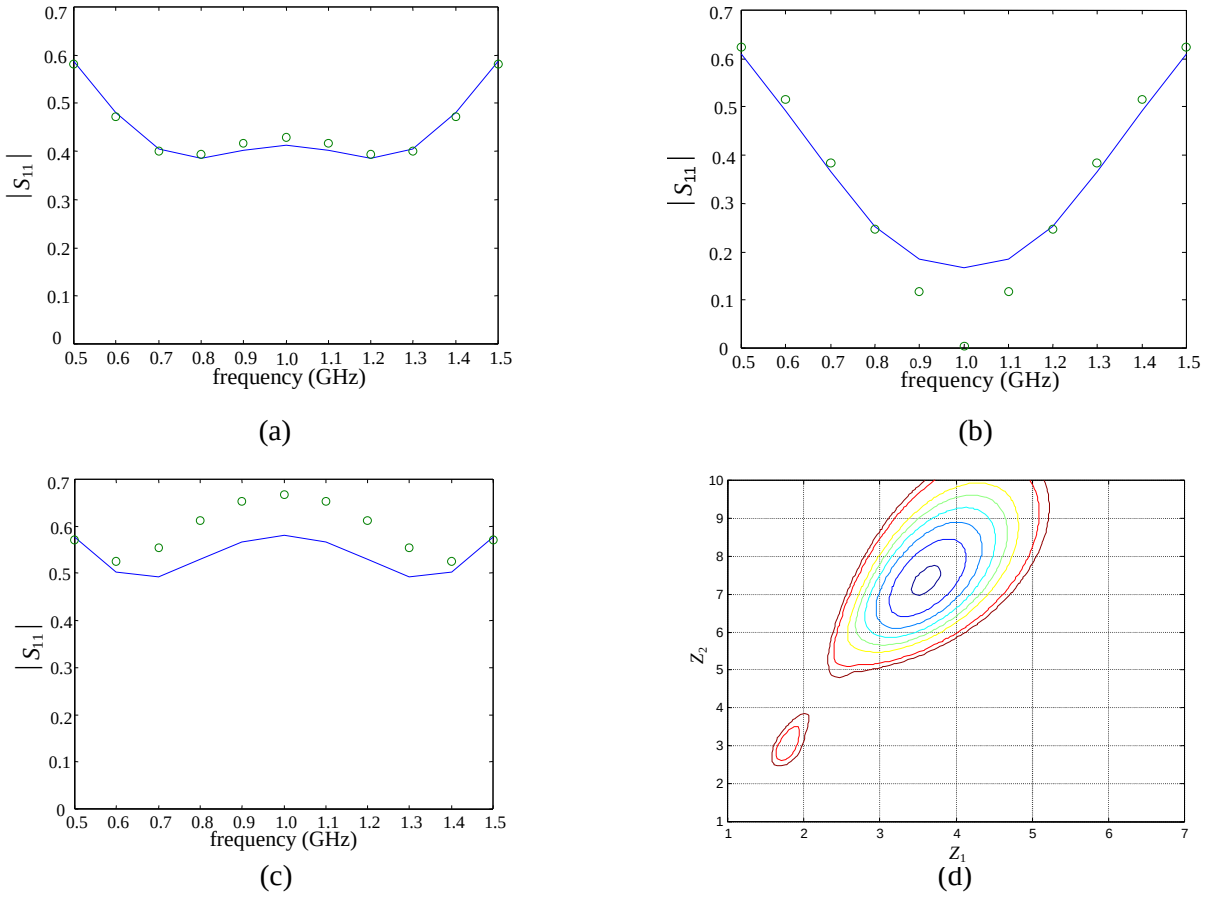


Fig. 3. Results for three-point parameter extraction for the 10:1 transformer, (a), (b) and (c) the responses at the first, second and third fine model points (o) and the responses (–) at the corresponding coarse model points, and (d) the corresponding contours of the ℓ_2 objective function.

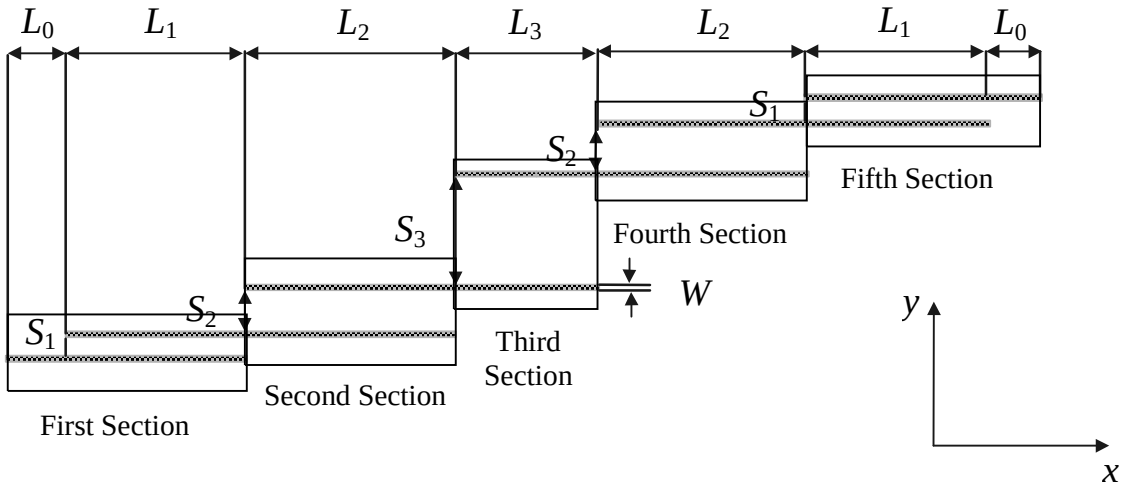
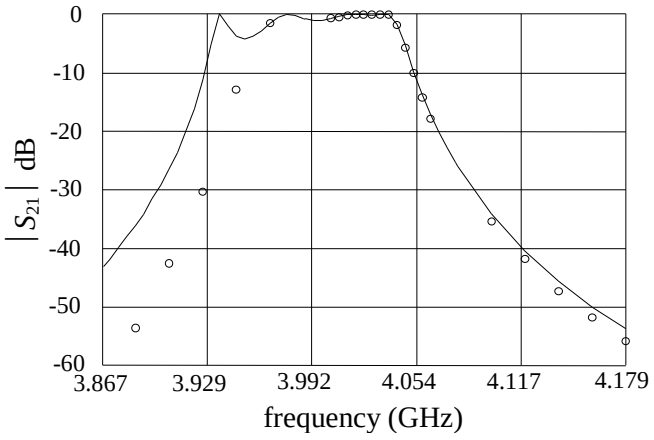
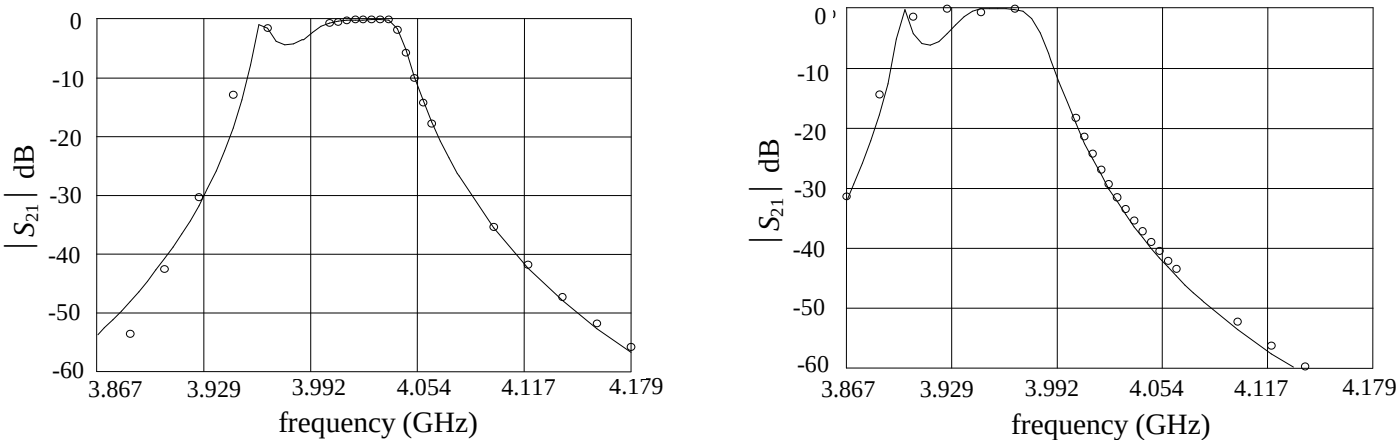


Fig. 4. The HTS filter [10].



(a)

Fig. 5. The fine model response (o) and the corresponding coarse model response (–) at the point utilized for single point extraction for the HTS filter. Note that only points in the range 3.967 GHz to 4.099 GHz were actually used.



(a) (b)

Fig. 6. The fine model response (o) and the corresponding coarse model response (–), (a) at the first point, and (b) at the second point utilized in the two-point parameter extraction for the HTS filter. Note that only points in the range 3.967 GHz to 4.099 GHz were actually used.

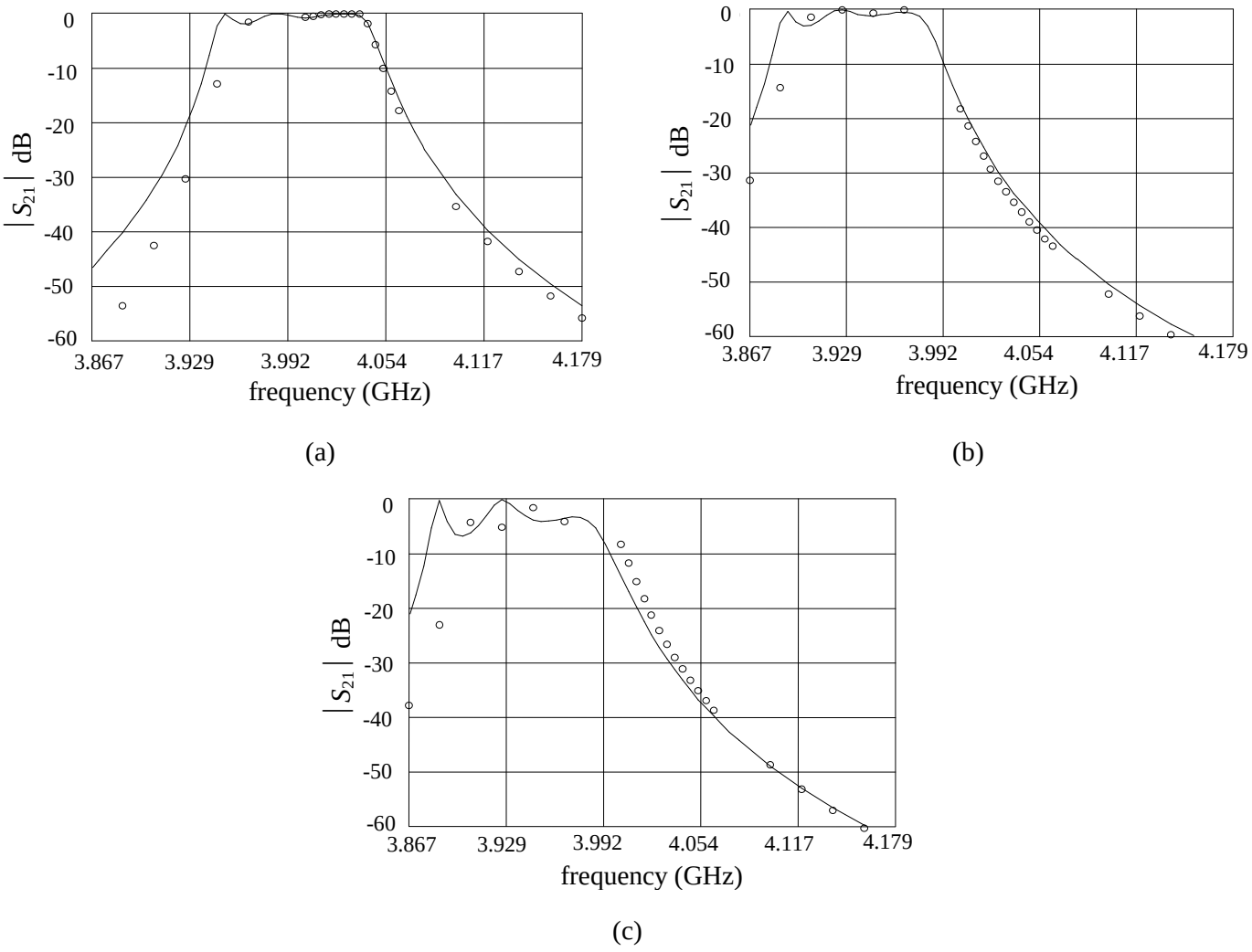


Fig. 7. The fine model response (o) and the corresponding coarse model response (–), (a) at the first point, (b) at the second point, and (c) at the third point utilized in the three-point parameter extraction for the HTS filter. Note that only points in the range 3.967 GHz to 4.099 GHz were actually used.

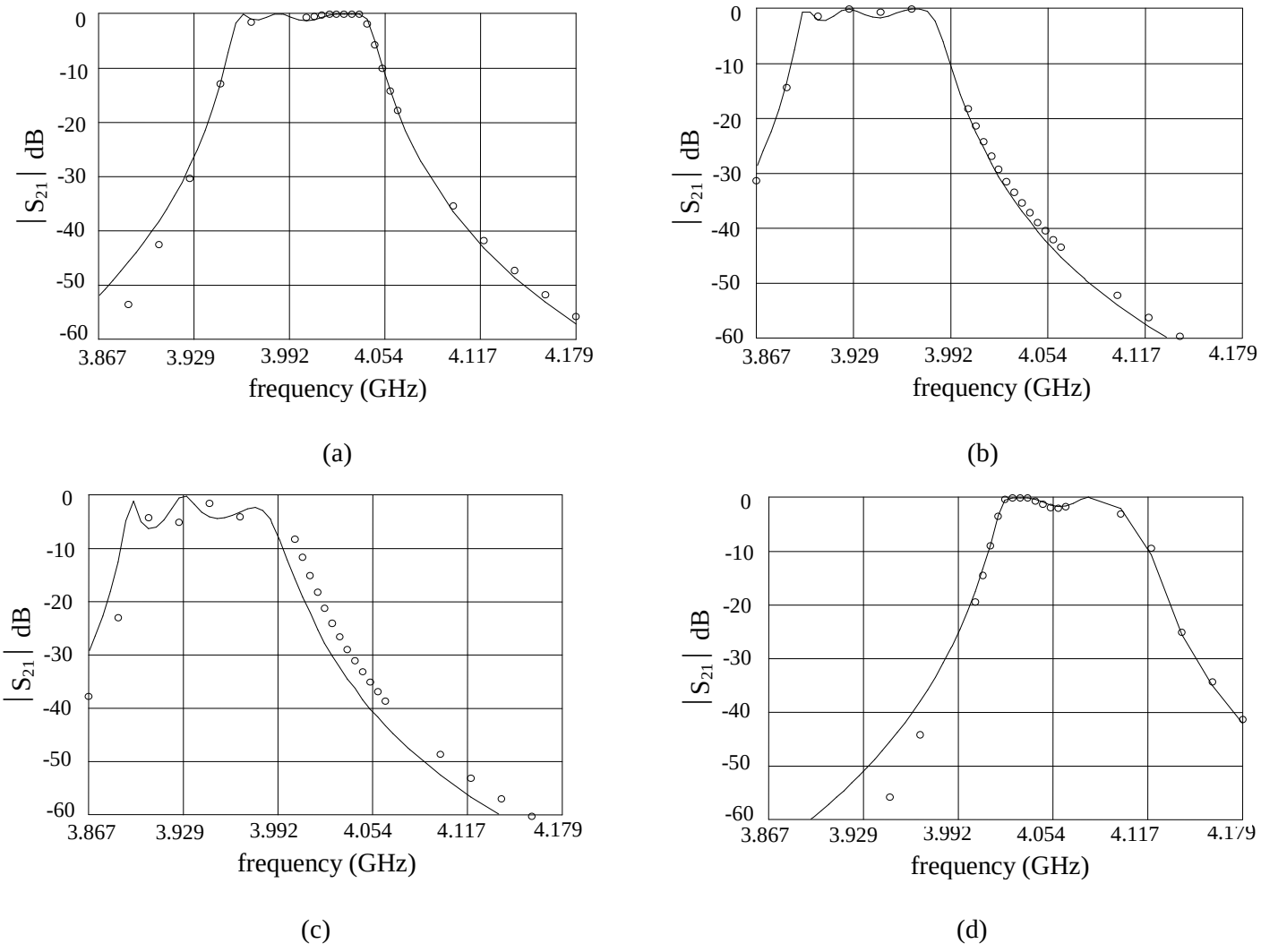


Fig. 8. The fine model response (o) and the corresponding coarse model response (–), (a) at the first point, (b) at the second point, (c) at the third point, and (d) at the fourth point utilized in the four-point parameter extraction for the HTS filter. Note that only points in the range 3.967 GHz to 4.099 GHz were actually used.