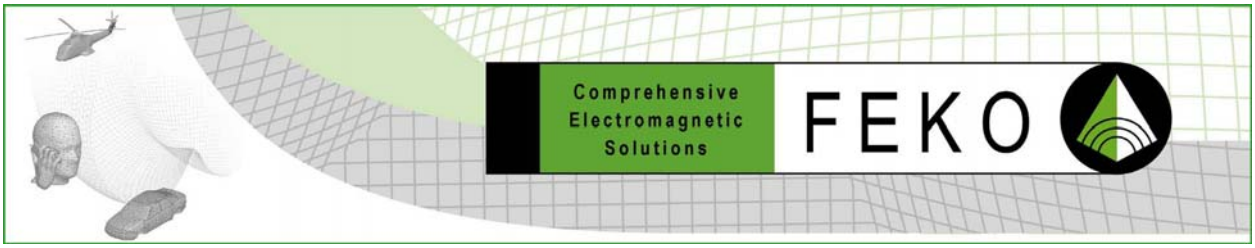


Microstrip Bandpass Filter

A microstrip bandpass filter is modeled in FEKO to determine its S-parameters

Filters are of the most common components in any communication network and in microstrip form integration with other components is easily achieved. In [1] a design for a bandpass filter at 4.0GHz in microstrip form is given and its performance is evaluated as one of the design parameters is changed. Figure 1 shows the layout of the filter and the variable parameter s1. This filter is modeled in FEKO and a grid search algorithm in OPTFEKO is used to determine a value for s1 resulting in the smallest reflection coefficient at 4.0 GHz.

Figure 1: Microstrip filter layout

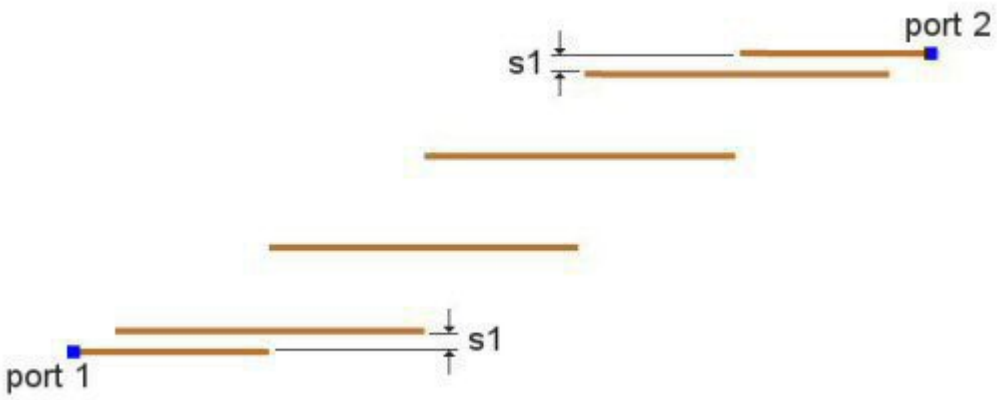
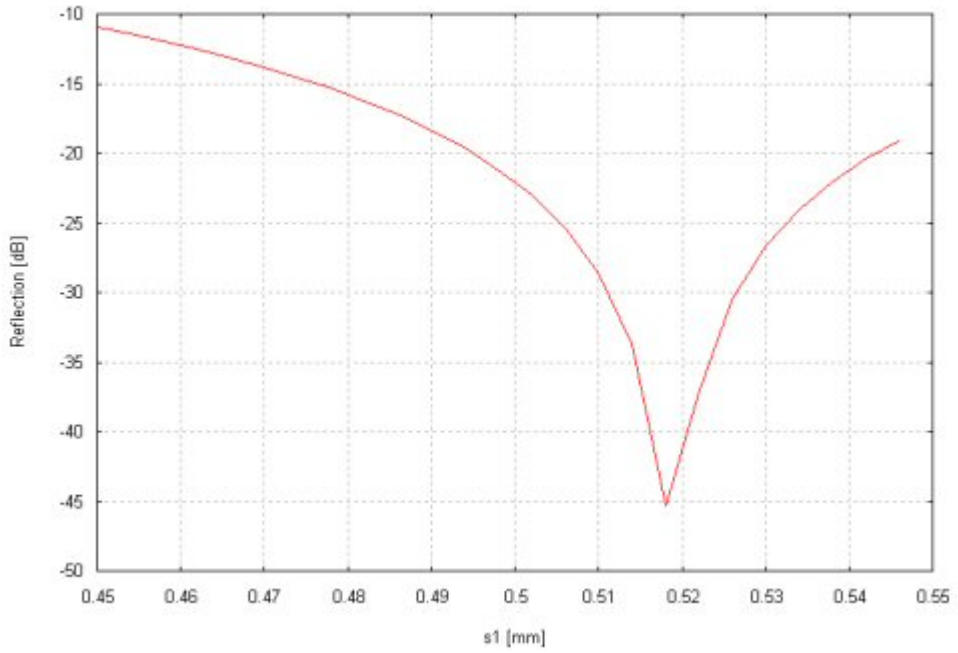


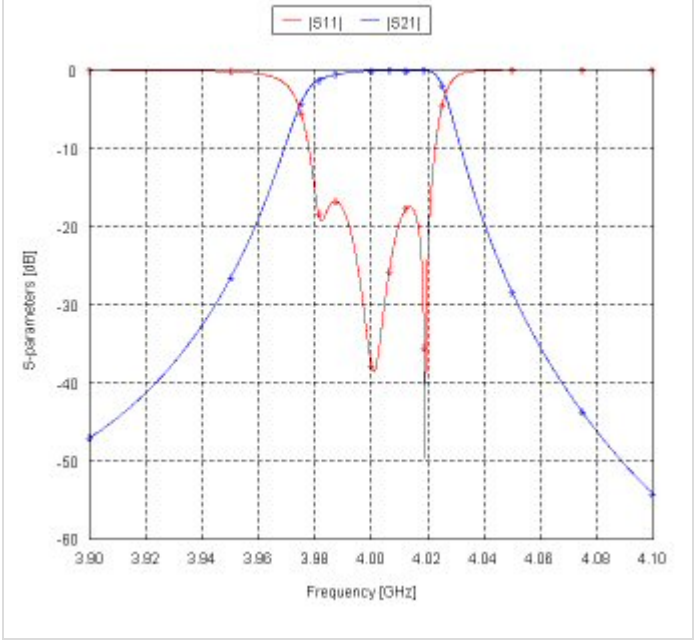
Figure 2 shows the input reflection (relative to 50Ohm) of the filter as the spacing s1 is varied.

Figure 2: Reflection coefficient at 4.0GHz for variable s1



From the results in Figure 2 a spacing of s1 = 0.518mm is chosen for the final design of the filter. The S-parameters for this final design is shown in Figure 3. The filter has a S11 < -10dB passband of about 20 MHz (0.5%) and S11 is nearly -40dB at 4.0GHz.

Figure 3: S-parameters of bandpass filter



References

[1]	J. Zhu, N.K. Nikolova, J.W. Bandler, "Self-Adjoint Sensitivity Analysis of High-Frequency Structures with FEKO", ACES 2006.