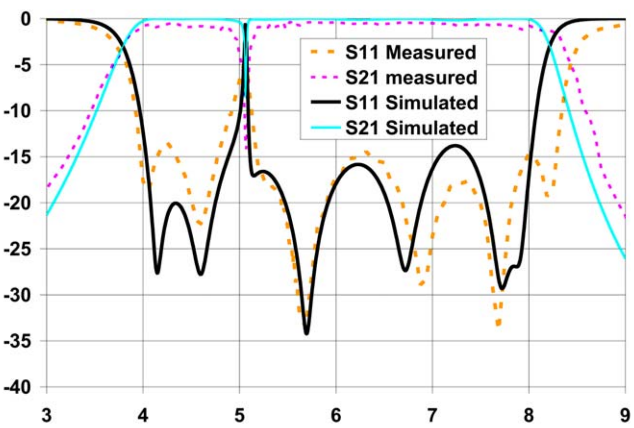

Figure 8 Measured performance of the filter with one transmission zero in the passband. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com]

It is also possible to add more than one resonators in the filter. Figure 6 shows another filter with two resonators added to the original filter. The resonant frequency and coupling strength of these two resonators can be adjusted independently to achieve two transmission zeros at different frequencies with different stopband widths. An example of the simulated result is shown in Figure 7. It can be seen that two transmission zeros are realized at 4.81 and 6.74, GHz respectively, while the frequency response of the filter at other frequencies is not significantly changed.

4. EXPERIMENTAL RESULTS

To validate the above theory, the filter shown in Figure 3 was fabricated and tested. The measured performance is shown in Figure 8, compared with the simulated result. The transmission zero is easily observed in the passband of the filter at 5.06 GHz. An attenuation of 14 dB is achieved in this region. The measured performance agrees well with the simulation. By comparing the measured results of the filter shown in Figure 8 and the original results shown in Figure 2, it can be seen that, apart from the transmission zero introduced, the filter performance is hardly changed at other frequencies.

5. CONCLUSIONS AND FUTURE WORK

In this article, the design of a wideband filter is briefed. By adding one or more extra resonators weakly coupled to the filter, one transmission zero can be introduced by each extra resonator and a relatively narrow stopband can be realized. These extra resonators have little effect on the filter at other frequencies.

As mentioned in the article, the extra resonators will affect the performance of the filter if the coupling is comparable to the internal couplings of the original filter. In the future work, it would be interesting to establish the synthesis/optimization algorithm, taking the extra resonator and its coupling strength to the filter into account when designing the filter, so that wider stopband can be achieved while maintaining good performance at other frequencies. As the extra resonator is independent from the filter, it is also possible to combine this idea with MEMS technology or other method to realize tunable stopband in the passband of broadband filters.

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DISCRETE GREEN'S FUNCTION APPROACH FOR THE ANALYSIS OF A DUAL BAND-NOTCHED UWB ANTENNA

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ABSTRACT: *A novel UWB monopole antenna with trident feeding and dual band-notched characteristics is proposed. The antenna consists of two bottom corner notches for improvement of impedance matching and two U-shaped slots for rejection of WLAN and WiMAX bands. Discrete Green's function approach has been utilized to numerically achieve time-domain current distribution on the antenna. A good agreement between simulation and experimental results is observed.* © 2013 Wiley Periodicals, Inc. Microwave Opt Technol Lett 55:2168–2174, 2013; View this article online at wileyonlinelibrary.com. DOI 10.1002/mop.27784

Key words: *DGF; dual band-notched; trident feeding; U-shaped slots; UWB antennas*

1. INTRODUCTION

Bandwidth enhancement of square planar metal plate monopole antenna has been considerably investigated due to the simplicity