عنوان مقاله:

Objective Functions for the Optimization of an Ultra Wideband Antenna

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نویسنده:

A. Contreras - *Department of Circuits and Communications, Faculty of Engineering, Universidad del Zulia, Maracaibo, Venezuela*

خلاصه مقاله:

This work proposes an objective function to optimize an ultra wideband antenna for adjusting the bandwidth and coupling with other elements, based on the performance comparison of several objective functions from the literature. The optimal dimensions of a printed rectangular monopole antenna were obtained with the Particle Swarm Optimization method to compare such functions. In the results of the comparison, the linear functions had a mean value of S_{11} magnitude near the threshold, but they presented a smaller standard deviation than the rest of the functions. The logarithmic and cubic functions showed a mean value of S_{11} magnitude higher than the double of the threshold, but they had superior standard deviation values, which did not happen with the quadratic function. Hence, the proposed function is the mean of a logarithmic expression with the quadratic argument. With this function, a bandwidth adjustment of ۱۳۰%, a mean S_{11} magnitude of -۲۲.۱ dB and a standard deviation equal to ۶.۷ dB were obtained on the resonant band for the designed antenna. In this way, the proposed function can be used to avoid interference with other wireless systems and to obtain a uniform coupling of the antenna.

کلمات کلیدی:

Objective Function, ultra wideband antenna, Particles Swarm Optimization, Bandwidth Adjustment, S_{11} Magnitude

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