

Low-cost approach based on an eigenfrequency method to obtain the dispersion diagram in CRLH structures

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Abstract-

A novel method to obtain the dispersion diagram of a composite right/left-handed (CRLH) unit-cell is presented. This method is based on CRLH transmission-line (TL) theory and on the structure eigenfrequencies. First, it is shown that computing the dispersion diagram of an M unit cell CRLH TL only needs three eigenfrequencies. Then, it is shown that this method drastically reduces the total computation time to obtain the CRLH unit cell dispersion diagram (from several hours to a few minutes). A four cell resonator has been designed and built to show the accuracy of the proposed method. Good agreement between the measured prototype and resonant frequencies provided by the dispersion diagram obtained with the eigenfrequency method has been achieved.

Index Terms- Composite right/left-handed (CRLH), transmission line (TL).

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