

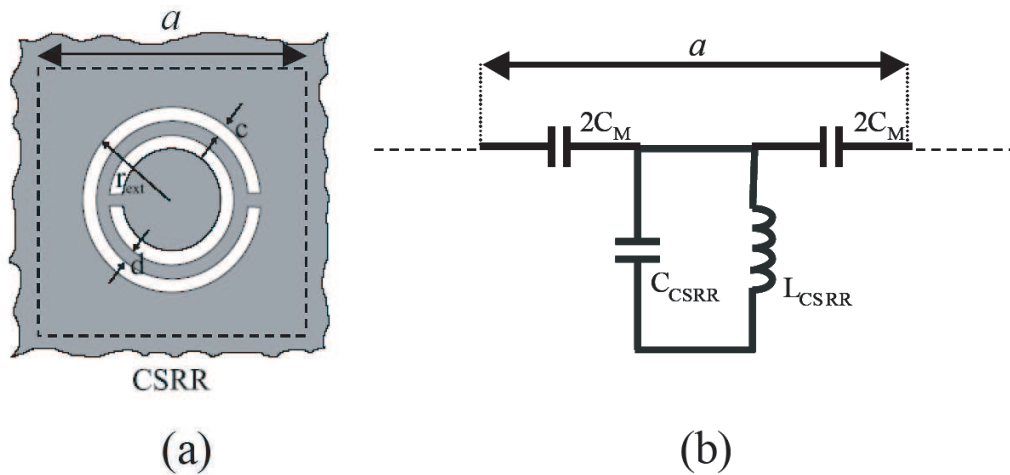
Electroinductive Waves on Chains of Resonators

M. Beruete¹, M. J. Freire², R. Marqués², F. J. Falcone¹, and J. D. Baena²

¹Universidad Pública de Navarra, Spain

²Universidad de Sevilla, Spain

A new kind of waves supported by chains of resonators drilled on a metallic substrate is presented. Propagation of energy comes as a consequence of the electric coupling between these resonators. Therefore, these waves are termed as electroinductive waves (EIWs). They can be interpreted as the dual counterpart of the so called magnetoinductive waves (MIWs) [1–3], which are due to the mutual inductance between chains of resonators. The unit cell of the analyzed structure is formed by the dual or “complementary” (in Babinet’s sense) particle of the split ring resonator (CSRR), recently reported in [4]. This unit cell, as well as its circuit model, is shown in the Figure. In order to show the existence and excitation of the reported EIWs, analytical calculations, electromagnetic simulations and experiments have been carried out. Both, simulations and experiments show a very good agreement with the analytical model.



REFERENCES

1. Shamonina, E., V. A. Kalinin, K. H. Ringhofer, and L. Solymar, *Electron. Lett.*, Vol. 38, 371, 2002.
2. Shamonina, E., V. A. Kalinin, K. H. Ringhofer, and L. Solymar, *J. Appl. Phys.*, Vol. 92, 6252, 2002.
3. Shamonina, E. and L. Solymar, *J. Phys. D*, Vol. 37, 362, 2004.
4. Falcone, F., T. Lopetegi, M. A. G. Laso, J. D. Baena, J. Bonache, M. Beruete, R. Marques, F. Martin, and M. Sorolla, *Phys. Rev. Lett.*, Vol. 93, 197401, 2004.