

**“Modal properties and radiative features of surface and leaky waves on metamaterial grounded slabs”, pp.180-186**

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**Abstract** – In this paper a review of some recent results concerning guidance and radiation phenomena in a double-negative (DNG) metamaterial grounded slab is presented. The dispersion behaviour of TM and TE modes supported by this structure is studied by means of a graphical analysis of the relevant dispersion equations and conditions are derived which ensure the suppression of surface waves in certain frequency ranges. Particular attention has been devoted to the excitation of such structure by means of dipole sources. With reference to leaky modes, it has been shown that, contrarily to ordinary double-positive (DPS) slabs, proper leaky modes are responsible for backward radiation from DNG slabs: moreover, frequency scan of a circular conical beam and highly-directive beams pointing at broadside may be achieved by properly choosing the physical and geometrical parameters of the structure. Numerical results are presented for specific structures with frequency-dependent constitutive parameters in order to illustrate the effects of both the surface-wave suppression and the peculiar radiation features of leaky waves.

