

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Electric field controlled left-handed-materials lens¹ S.V. BELY, R.V. PETROV, M.I. BICHURIN, A.V. FILIPPOV, Novgorod State University, Russia, G. SRINIVASAN, Oakland University, MI — Microwave lenses are useful for scanning and multi-beam antennas of radar systems, telemetries, and radio-astronomy of the cm and mm-wave bands. The development of electric and/or magnetic field controlled lenses using magnetoelectric material would facilitate improvement of the antenna technologies. We designed such lenses consisting of metal resonators on dielectric substrates with the control elements made of yttrium iron garnet and PZT. The control is based on the variation of magnetic permeability of the ferrite via the electric potential applied to piezoelectric. It results in change in the parameters of transmitted microwave-beam and focal length of the lens. The lens works in cm-wave band. The gain factor of the lens is 6 dB. Theoretical estimates and optimization of the lens parameters were also carried out.

¹Supported by grants from NSF, Russian Foundation for Basic Research and Russian Ministry of Education and Science.

G. Srinivasan
Oakland Univ.

Date submitted: 23 Nov 2007

Electronic form version 1.4