Electromagnetic wave transmission of over-dense plasma with parabolic electric permittivity profile

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Abstract
In this paper, a theoretical study of electromagnetic wave passing through inhomogeneous over-dense plasma was performed. It was supposed that the plasma layer is immersed in vacuum and the plasma density has a parabolic profile form. In this way, the electric permittivity profile decreases gradually, acquires negative values, and then again becomes positive on the other side of the slab. It has been shown that how this structure is suitable for the transmission of electromagnetic waves in a wide range of the incident angle. To this end, the normal mode and the oblique incident was considered. Then the amplitude of the electromagnetic waves and the reflection coefficient were analytically and exactly calculated and discussed. Dependence of the coefficient of the entire structure to the parameters influencing the problem was evaluated.

Keywords: anomalous electromagnetic wave transmission, over-dense plasma, parabolic density, plasma with varying density

For full article, refer to the Persian section