

TRANSILLUMINATION, QUASITRANS Parency
AND INFORMATION TRANSPARENCY
OF THE WAVE BARRIERS
IN INHOMOGENEOUS PLASMAS

I.O. Anisimov, L.I. Romanyuk

Taras Shevchenko National University of Kyiv
(2, Prosp. Academician Glushkov, Kyiv 03022, Ukraine)

S u m m a r y

A classification of wave barriers in inhomogeneous plasmas and effects of their overcoming by waves is proposed. Transillumination is caused by non-linear modification of barrier via the incident wave. Quasitransparency is caused by the transformation of the incident wave at the barrier border and its regeneration in the trans-barrier plasma. Information transparency is caused by the transfer of information about the incident wave to the trans-barrier region. Mechanisms of transillumination caused by the barriers' destruction by the incident waves, by effects of electromagnetically induced transparency, and by relativistic effects are treated. The main types of the plasma wave barriers' quasitransparency are discussed, i.e. quasitransparency caused by Van Campen modes, quasitransparency induced by the electron beams' motion through the barriers, and quasitransparency caused by the transversal magnetic field. Mechanisms of the information transparency generated by the waves' conversion, caused by the upper harmonics generation, and determined by the effect of plasma echo are discussed.