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Anomalous wave amplification in strongly inhomogeneous geophysical media

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In general, the wave propagation in inhomogeneous media is accompanied by the energy loss due to reflection from the zones of strongly varied medium parameters. Meanwhile, the reflection effects can be absent for certain conditions even the inhomogeneity is strong. Method to get such certain conditions is described. It is based on mapping of initial variable-coefficient wave equation to the constant-coefficient Klein-Gordon equation. As a result, the set of second-order ordinary differential equations for the wave speed is derived. Their solutions described several kinds of non-reflected wave propagation discussed in details. The applications of developed approach to the various problems in geophysics (surface and internal waves in the ocean, acoustical waves in the inhomogeneous atmosphere, MHD waves in solar corona, etc) are reviewed.