

TA013

MODELING AND MATERIAL INTERACTIONS

“SELFTRANSLUCENCE” EFFECT OF POWERFUL MICROWAVE PENETRATION IN WATER

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Absorptive and reflective properties of liquids with reference to the “weak” microwaves have been investigated in sufficient detail [1]. Determination of reflection and absorption coefficients for specific liquid substances that have not been adequately explored are interesting only.

Today, the problem of propagation of microwaves holds the greatest interest in the cases when the energy transported by electromagnetic wave is so high that it changes the state of liquid medium and hence cannot be described by linear electrodynamics.

The objective of this paper is determination of mechanisms of powerful microwave penetration into the water and its solutions.

Propagation of microwaves with high energy density in a water column has been investigated experimentally. The “selftranslucence” effect (abnormal deep penetration of microwave in a water column) associated with sequential heating of a thin water layers from surface into the column depth has been found. Calculations were performed in the framework of a model to take into the account the electrophysical property changes of water under the action of powerful microwave radiation. Calculations are compared with experimental results.

The “selftranslucence” phenomenon application for waste water cleaning is discussed.

REFERENCES

[1] H.Puschner, Heating with microwaves. Fundamentals, components and circuit technique. 1966.