

An Application of Diffraction Theory to Echo Formation

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Abstract

Diffraction theory is applied to treat echo-formation problems in this paper. This overcomes some drawbacks of the previous accepted image pulse theory. The new approach provides a comprehensive physical interpretation to the mechanism of echo formation. It predicts different echo behaviours for objects made of different materials, and gives results to problems of echo formation by smoothly curved surfaces. In these aspects, the previous theory breaks down. In principle, the diffraction approach can tackle any echo-formation problem so long as there exists a solution to the relevant configuration of diffraction. The method is strongly supported by experimental results.