Wave Field Extrapolation: Addendum to SEP-41 article

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"The following figures were described in the SEP-41 article "Wave Field Extrapolation", but not published with it. They include group velocity and impulse responses for the 45 degree, 65 degree, causal dip filtering, and split equation operators (figures 1 through 5). In addition there is a salt dome synthetic with strong lateral velocity variations (figures 6 through 10). The field data example described in the SEP-41 article is not included (figures 11 and 12).

-editor's comments

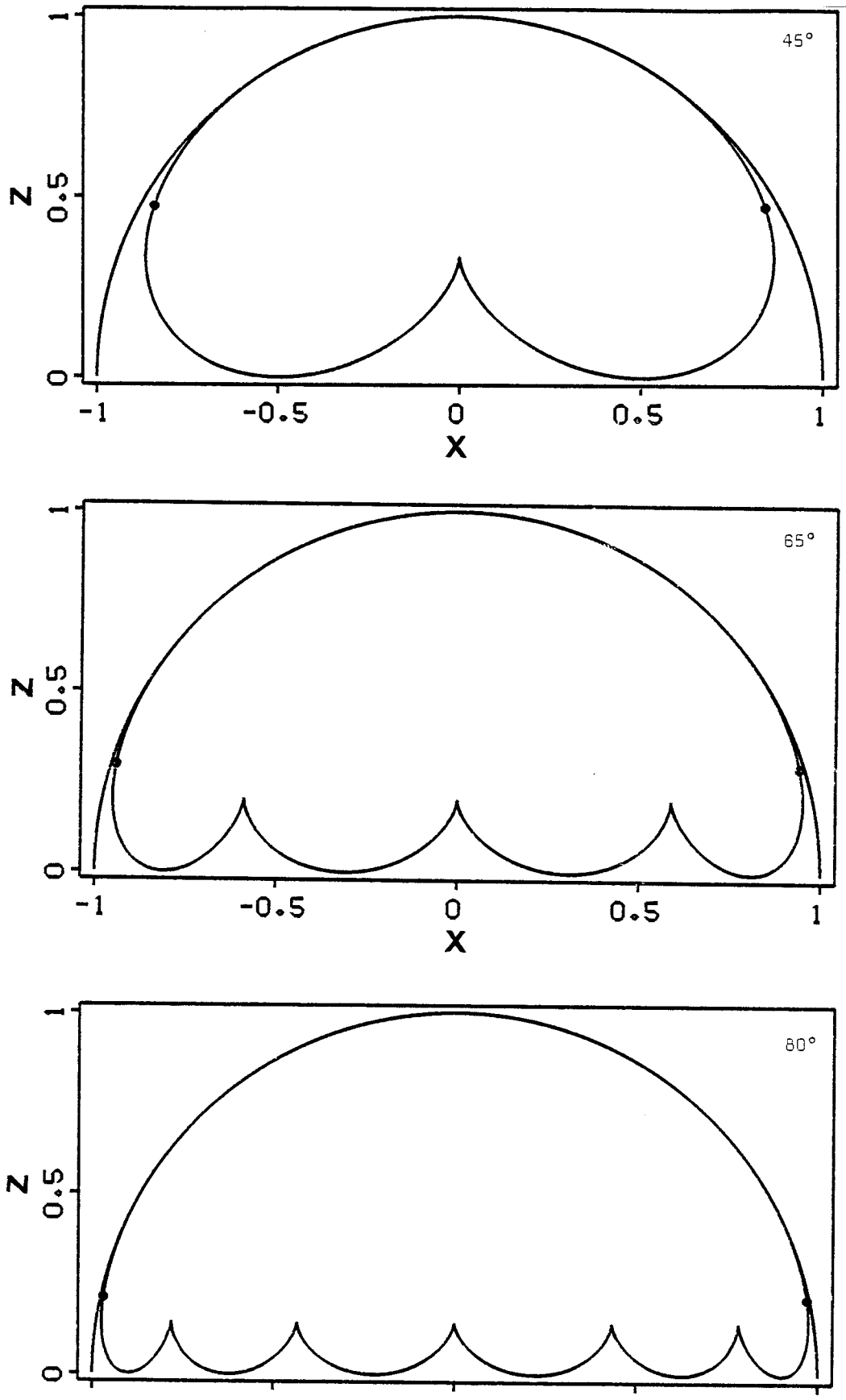

FIG. 1. Group velocity parametric curves for the 45-, 65-, and 80- approximations of the square root.

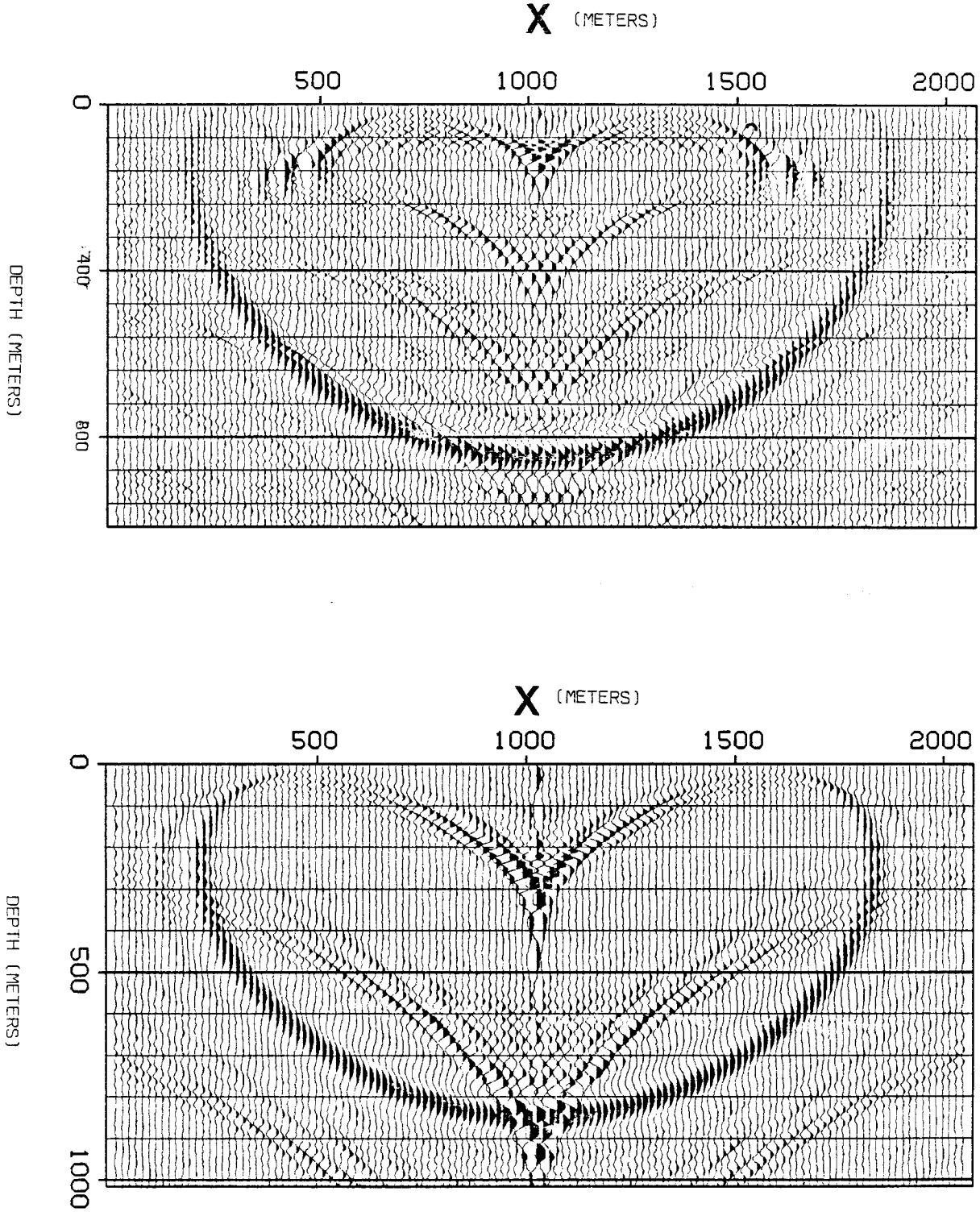

FIG. 2. (Top) 65- degree impulse response. No dip filtering has been applied. (Bottom) 45- degree impulse response. No dip filtering has been applied.

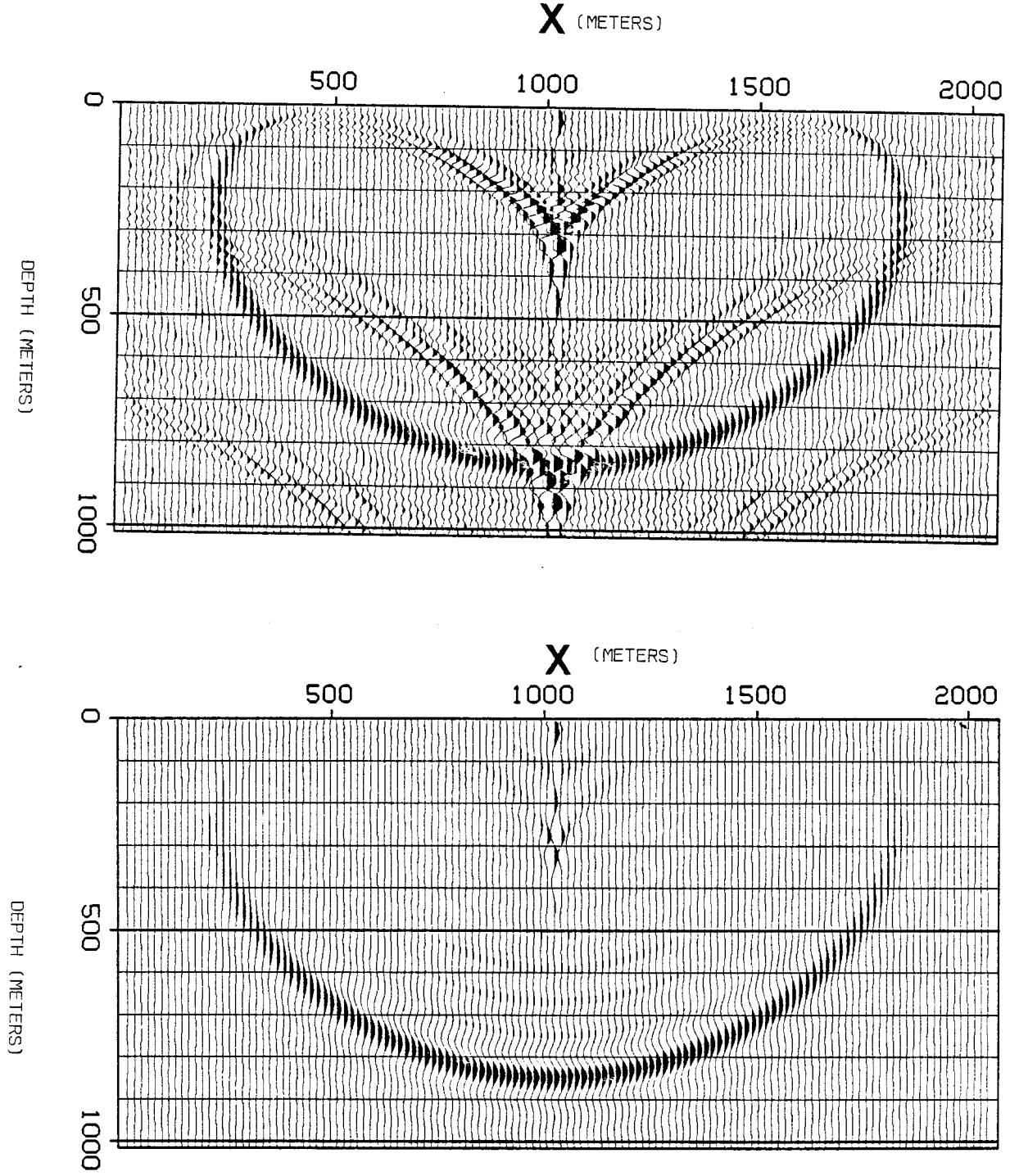

FIG. 3. (Top) 45- degree impulse response without dip filtering.
(Bottom) 45- degree impulse response with causal dip-filtering. The evanescent waves have been removed.

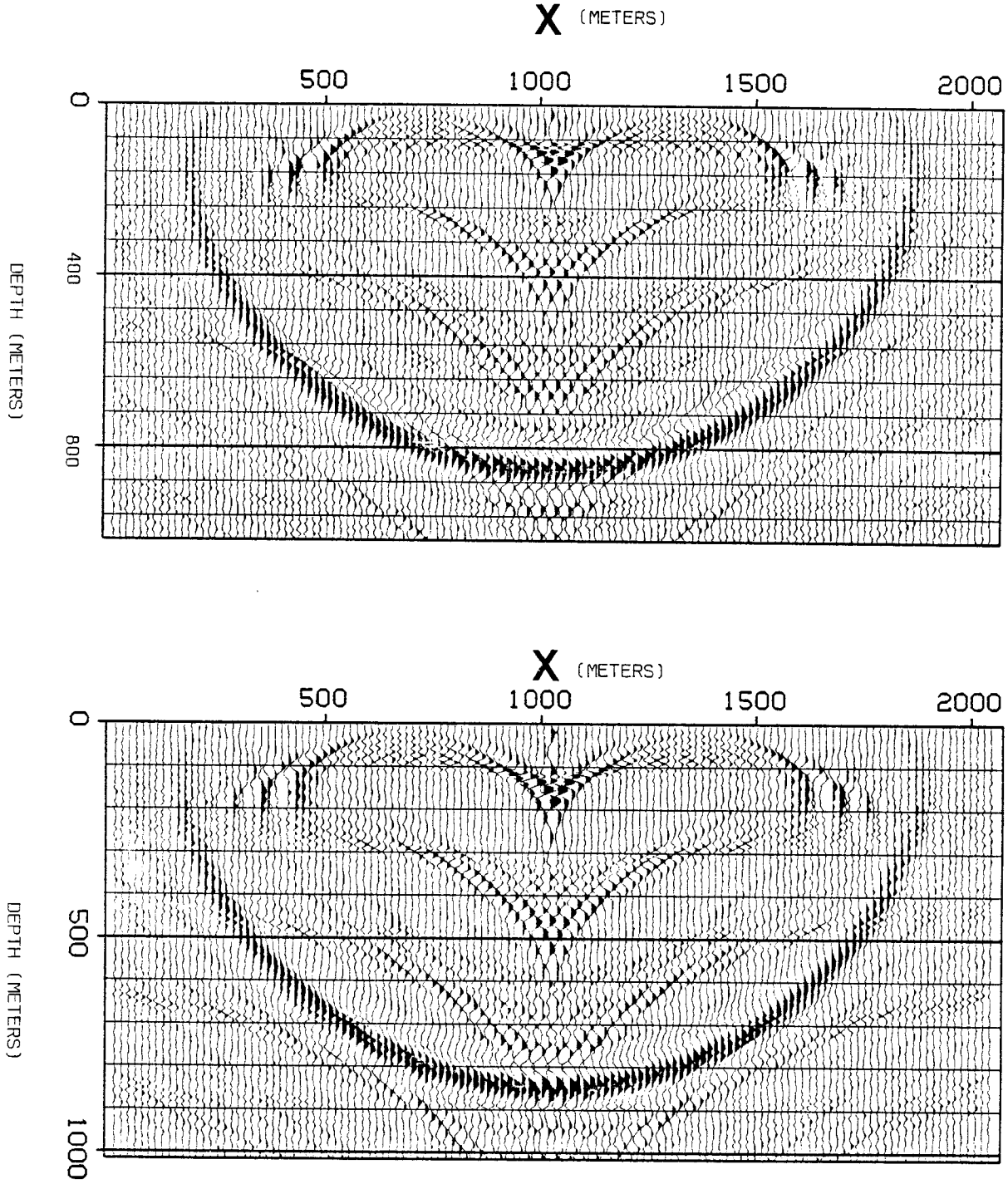

FIG. 4. (Top) 65- degree impulse response with a split 65- degree extrapolation operator. (Bottom) 65- degree impulse response with a non-split 65- degree extrapolation operator.

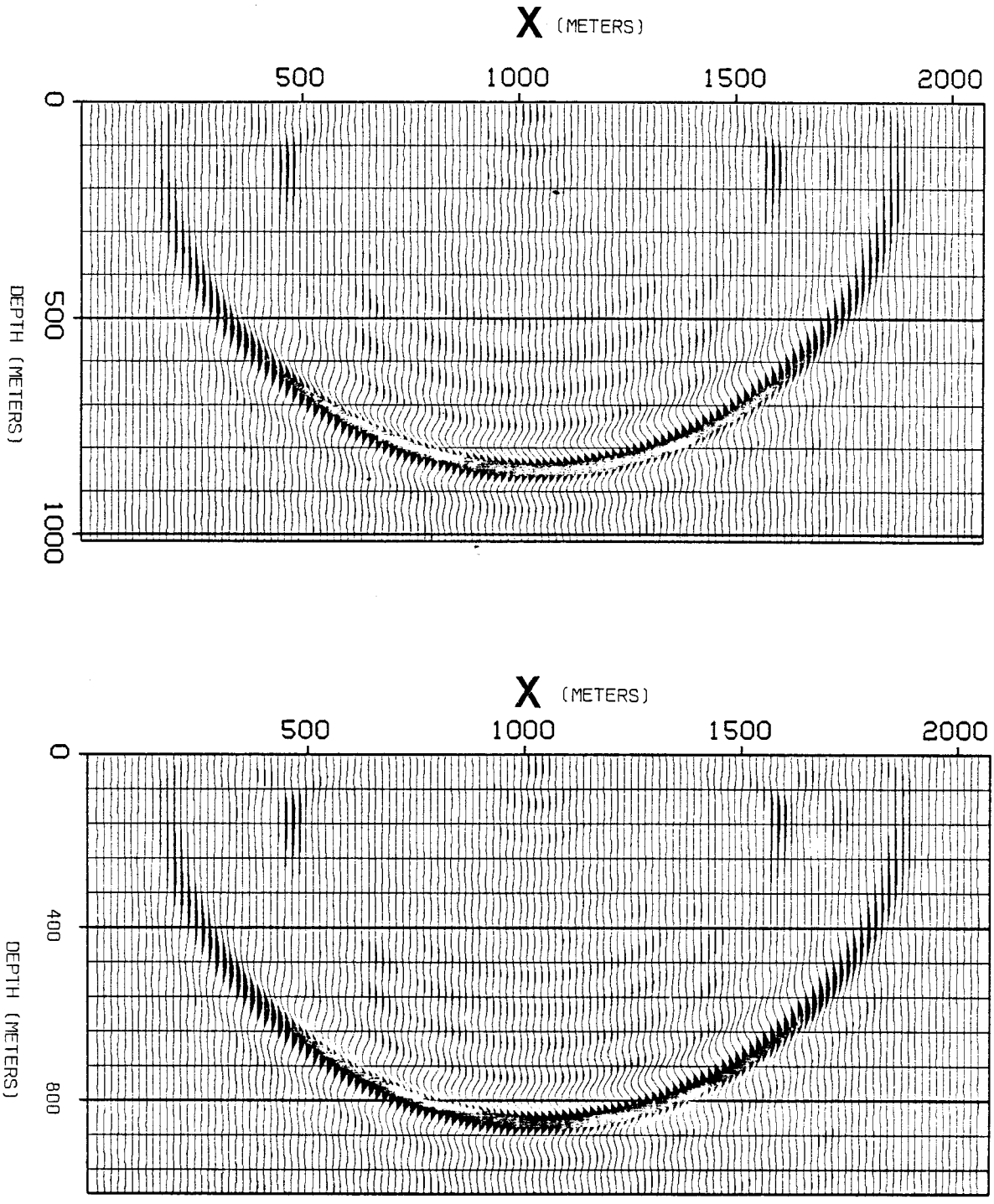

FIG. 5. (Top) 65- degree impulse response with a split 65- degree extrapolation operator. A dip filter has been used inside the operator.
(Bottom) 65- degree impulse response with a non-split 65- degree extrapolation operator with same dip filter.

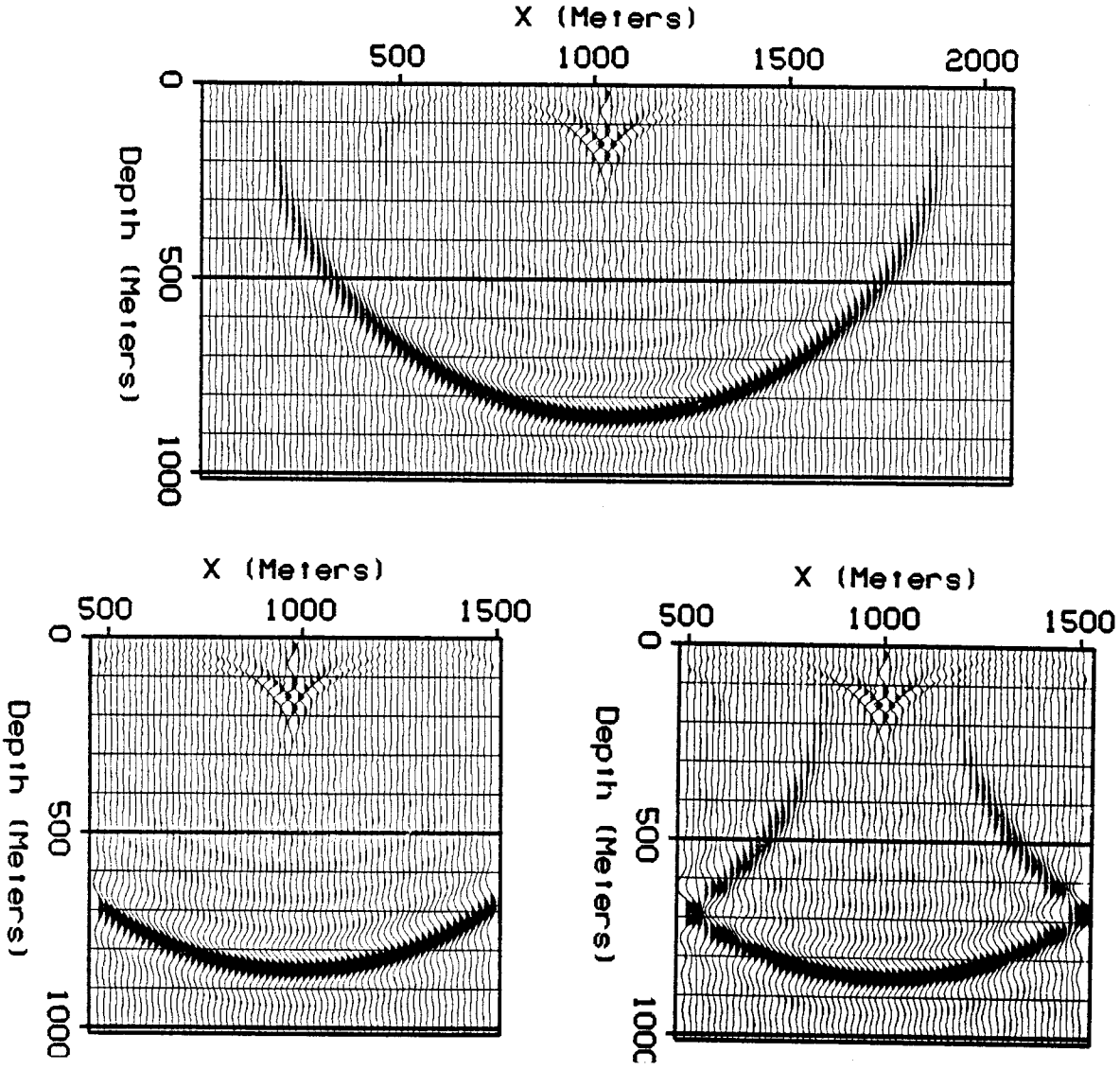

FIG. 5A. (Top) Image of a downgoing wave at t = 280 ms. with constant velocity v = 3000 m/s. The impulse responses has been generated by the downward continuation of a point source (located at the top of the plot) with the 65 degree extrapolation operator and mixed side absorbing boundary conditions. The grid size is 128 traces and 128 extrapolations, dx = 16 m., dz = 8 m.
(Bottom left) Same impulse response, but with half the grid width.
(Bottom right) Same situation as bottom left, except with zero-slope (reflecting) boundary conditions.

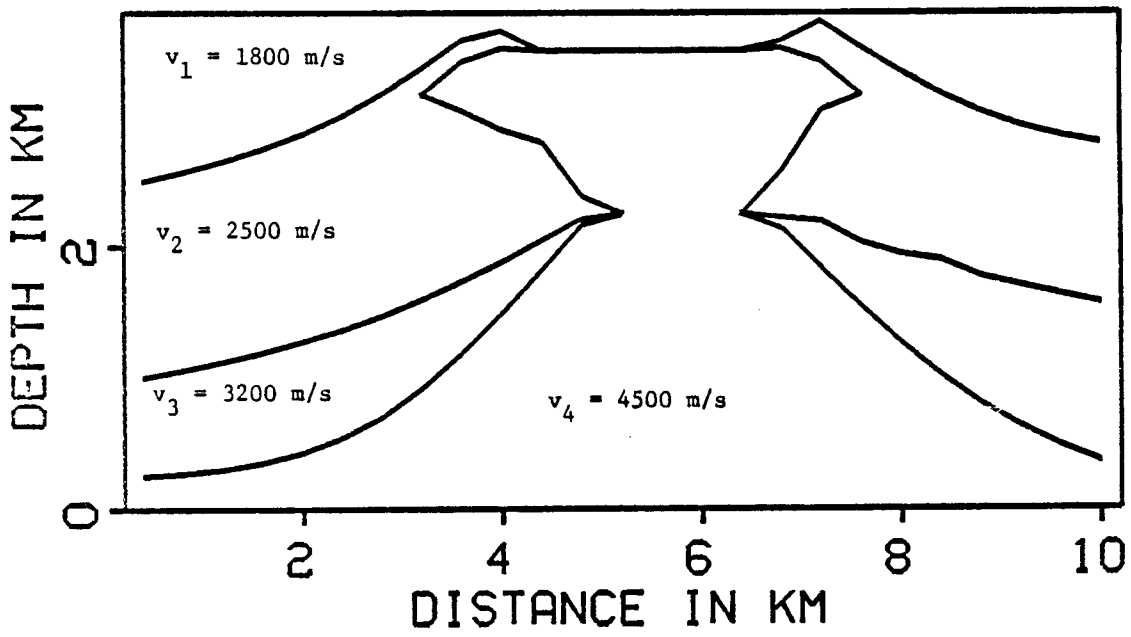

FIG. 6. Velocity model used to generate the zero offset section in Figure 7.

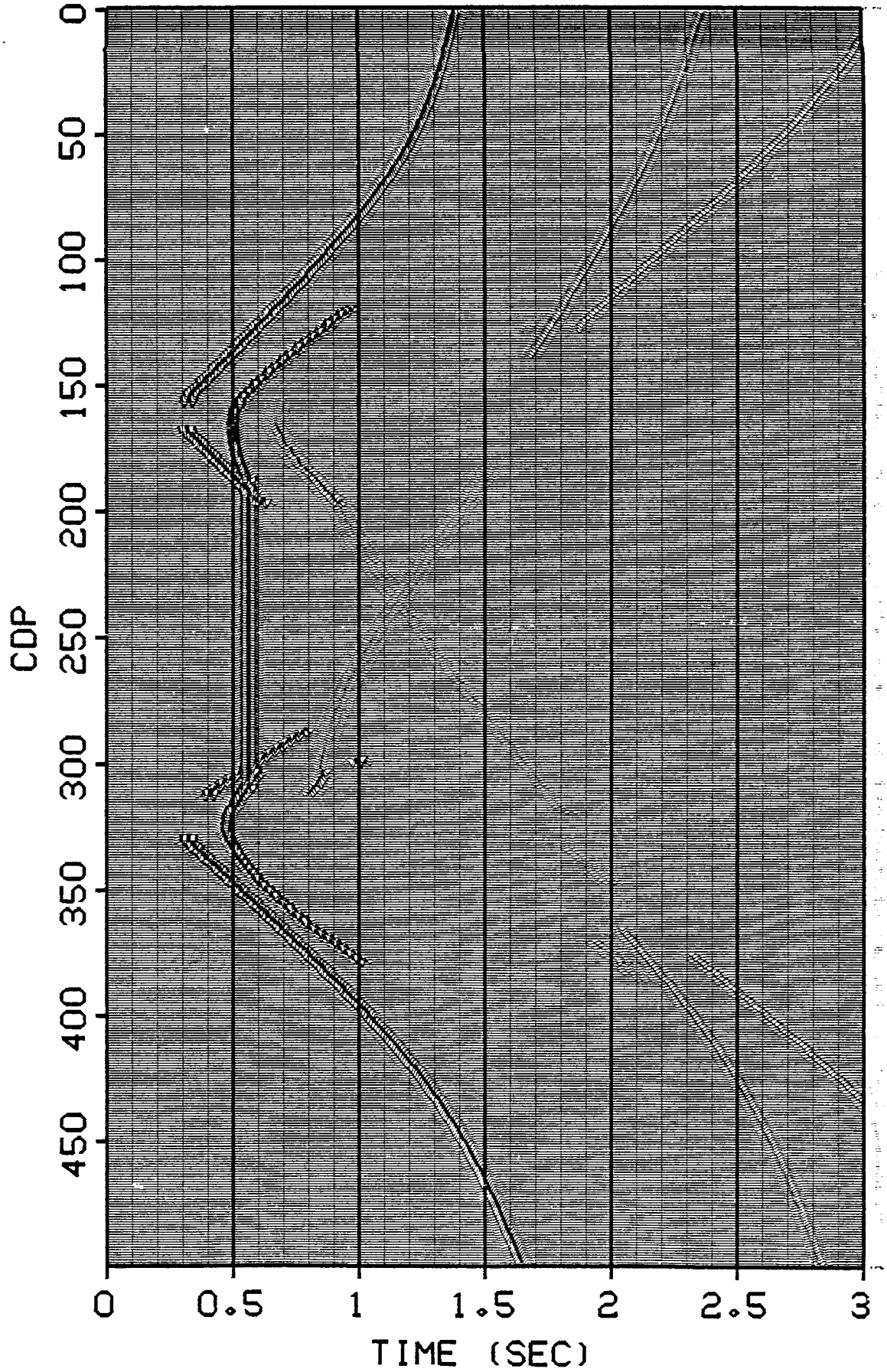

FIG. 7. Synthetic zero-offset section.

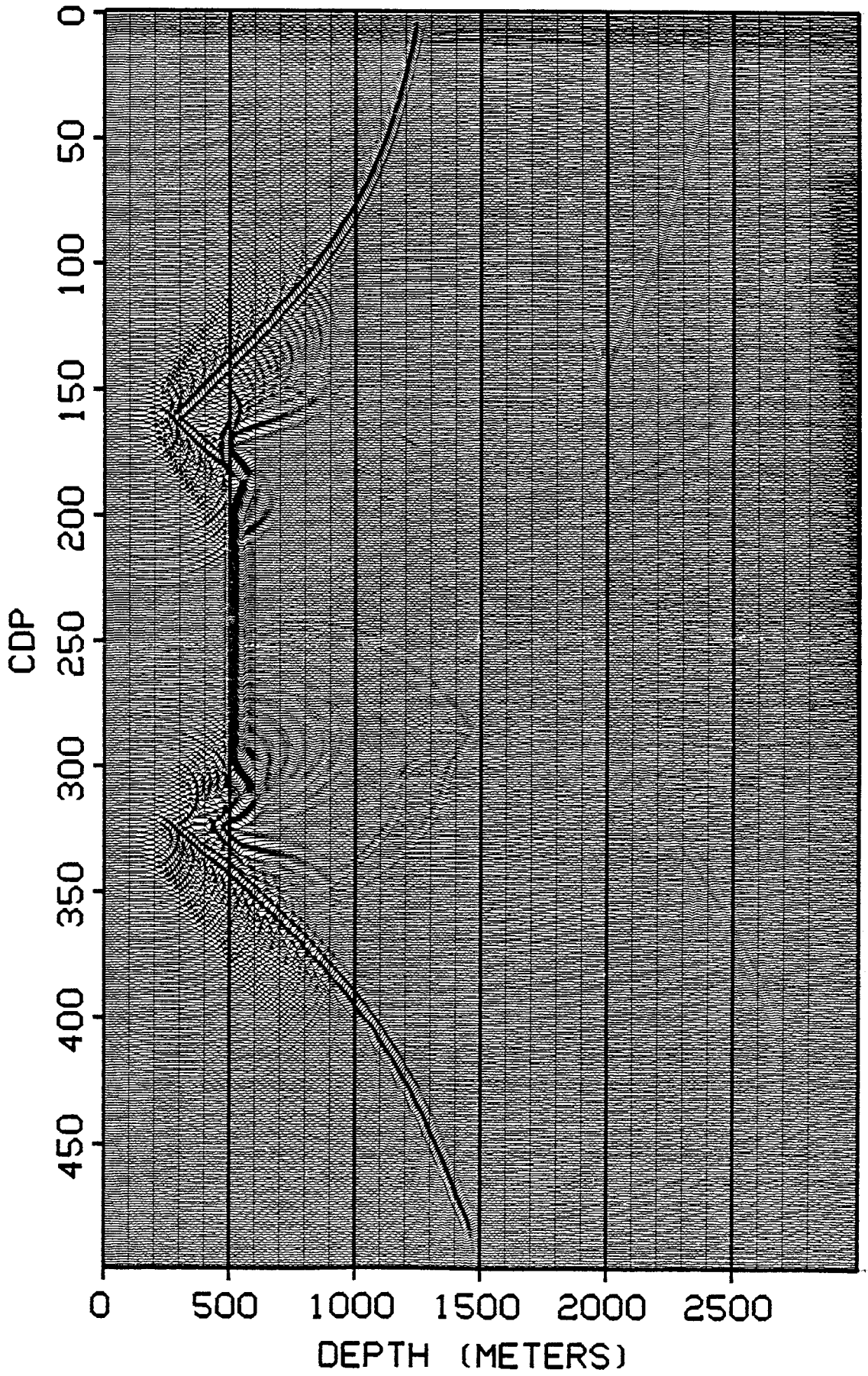

FIG. 8. Depth migrated section of Figure 7.

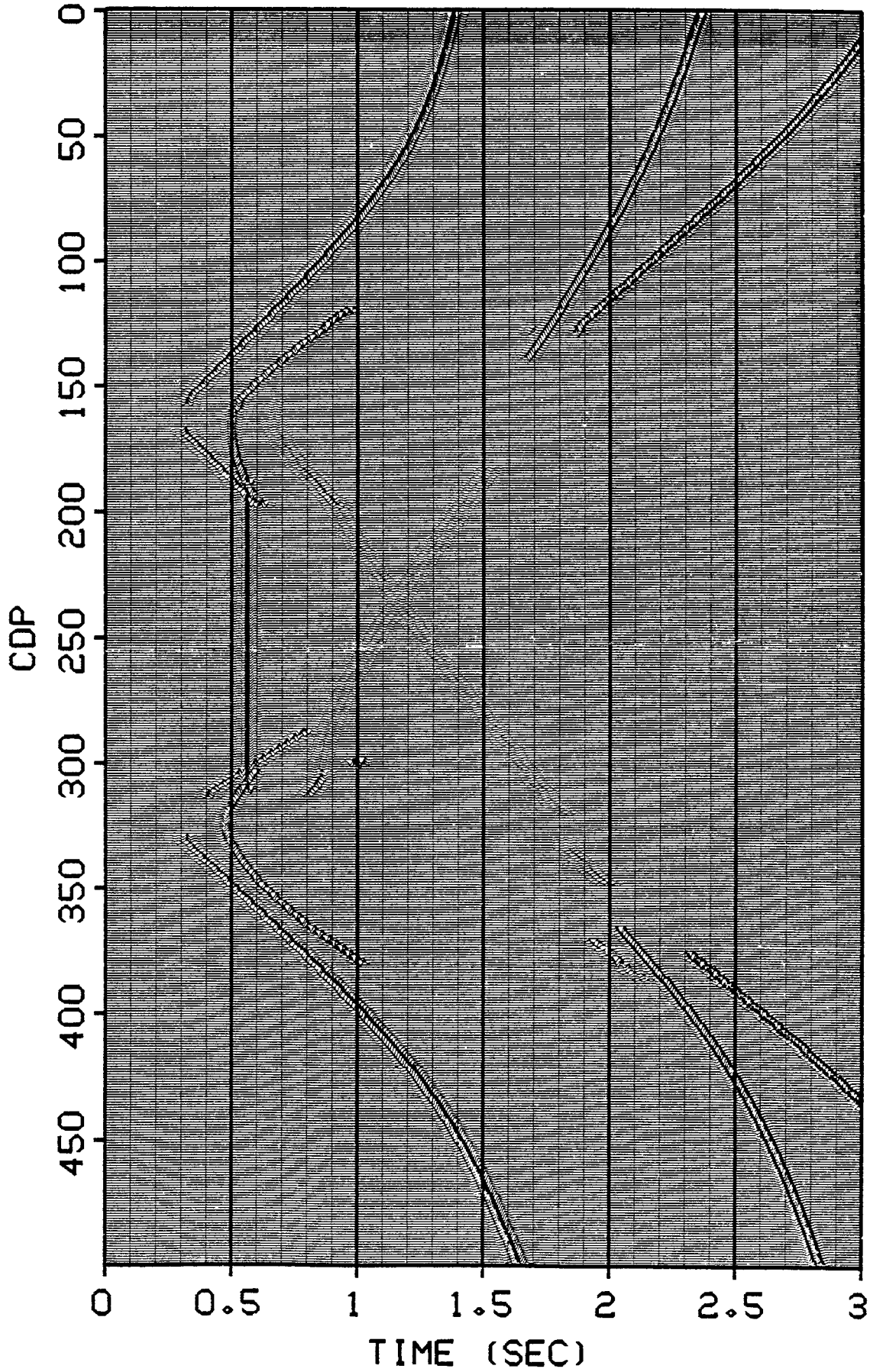

FIG. 9. Synthetic zero-offset section after equalization by a power-of-time gain function.

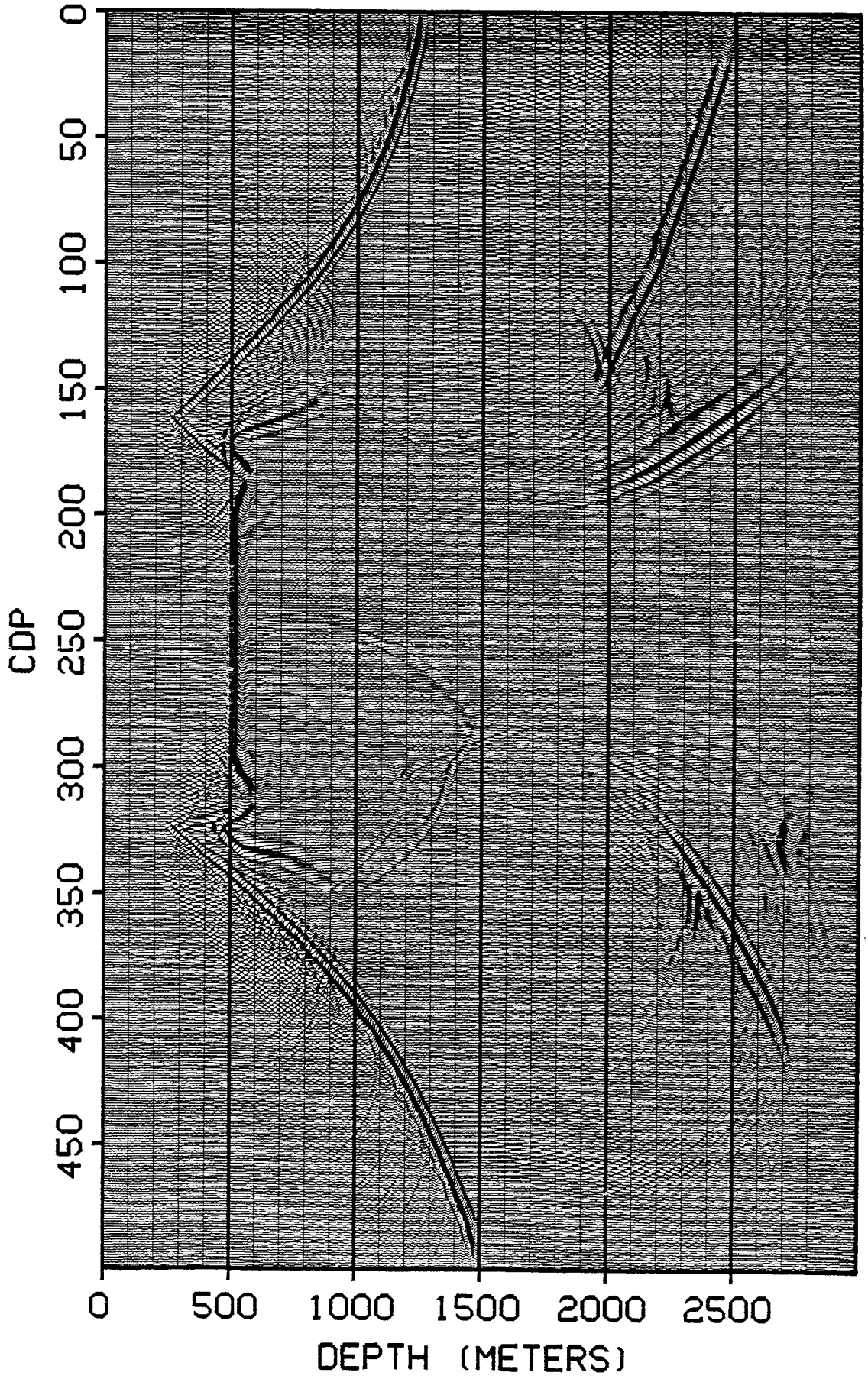

FIG. 10. Depth migrated section of Figure 9.