more non-Gaussian. A measure *F* defined from cross entropy measures non-Gaussianity from local histograms of an array, and thereby measures focusing. Local histograms of the transformed data and of transformed, artificially incoherent data provide enough information to estimate the amplitude distributions of transformed signal and noise; errors only increase the estimate of noise. These distributions allow the recognition and extraction of samples containing the highest percentage of signal. Estimating signal and noise iteratively improves the extractions of each. After the removal of bed reflections and noise, *F* will determine the best migration velocity for the remaining diffractions. Slant stacks map lines to points, greatly concentrating continuous reflections. We extract samples containing the highest concentration of this signal, invert, and subtract from the data, leaving diffractions and noise. Next, we migrate with many velocities, extract focused events, and invert. Then we find the least-squares sum of these events best resembling the diffractions in the original data. Migration of these diffractions maximizes *F* at the best velocity. We successfully extract diffractions and estimate velocities for a window of data containing a growth fault. A spatially variable least-squares superposition allows spatially variable velocity estimates. Local slant stacks allow a laterally adaptable extraction of locally linear events. For a stacked section we successfully extract weak signal with highly variable coherency from behind strong Gaussian noise. Unlike normal moveout (NMO), wave-equation migration of a few common-midpoint (CMP) gathers can image the skewed hyperbolas of dipping reflectors correctly. Short local slant stacks along midpoint will extract reflections with different dips. A simple Stolt (1978) (*f-k*) type algorithm migrates these dipping events with appropriate dispersion relations. This migration may then be used to extract events containing velocity information over offset. Offset truncations become another removable form of noise. One may remove non-Gaussian noise from shot gathers by first removing the most identifiable signal, then estimating the samples containing the highest percentage of noise. Those samples containing a significant percentage of signal may be zeroed; what remains represents the most identifiable noise and may be subtracted from the original data. With this procedure we successfully remove ground roll and other noise from a shot (field) gather.

A. J. Berkhout. *Multidimensional linearized inversion and seismic migration*

This paper discusses the close relationship between seismic migration and multidimensional inversion according to the linearized inverse scattering theory. The linearized inverse scattering approach represents a mixed modeling-inversion procedure. Unlike seismic migration, the actual inversion process is carried out on the difference between a modeled reference response and the actually measured data. The output is generally presented in terms of the elastic parameters of the medium. Siesmic migration represents a direct inversion method: the downward extrapolation process is carried out directly on the measured data. Output is presented in terms of reflectivity. If the reference medium has been chosen in such a way that (1) the total wave field in the reference medium can be split into a downward traveling source wave field and an upward traveling response (the propagation of both wave fields being defined by the one-way wave equation) and that, (2) the upward traveling response in the reference medium can be neglected with respect to the upward traveling response in the actual medium, then seismic migration and linearized inversion define identical inversion processes. Typically, the above conditions are fulfilled in a homogeneous reference medium. In iterative multidimensional inversion, the full inverse scattering problem is approached by a number of linearized inversion steps. I show that each linear step consists of a prestack migration process and a prestack modeling process, the modeling output being used to remove the contribution of multiple scattering. Finally, I argue that for a proper inversion process, information on the elastic parameters outside the seismic frequency bandwidth (temporarily and spatially) should be accounted for in the reference medium.

P. Temme. *A comparison of common-midpoint, single-shot, and plane-wave depth migration*

A comparison of common-midpoint (CMP), single-shot, and plane-wave migration was made for simple two-dimensional structures such as a syncline and a horizontal reflector with a laterally variable reflection coefficient by using synthetic seismograms. The seismograms were calculated employing the finite-difference technique. CMP sections were simulated by 18-fold stacking and plane-wave sections by slant stacking. By applying a finite-difference scheme, the synthetic wave field was continued downward. The usual imaging condition of CMP migration was extended in order to carry out migration of single-shot and plane-wave sections. The reflection coefficient was reconstructed by comparing the migrated wave field with the incident wave field at the reflector. The results are: (1) all three migration techniques succeeded in reconstructing the reflector position; (2) as a consequence of the finite aperture of the geophone spread, only segments of the reflector could be reconstructed by single-shot and plane-wave migration; (3) for single-shot and plane-wave migration the reflection coefficient could be obtained; and (4) CMP migration may lead to incorrect conclusions regarding the reflection coefficient.

B. S. Byun. *Seismic parameters for transversely isotropic media*

One of the most important problems in exploration seismology is to relate the surface seismic measurements with the subsurface geologic parameters. The concept of wavefront curvature has been in extensive use for this purpose. Byun (1982) developed relationships between several measurable seismic parameters (e.g. geometrical spreading and normal moveout velocity) and parameters of the media with elliptical velocity dependencies. This paper extends the wavefront curvature concept to more general, transversely isotropic media. After a brief discussion on ray tracing, a procedure is developed to describe the local properties of the ray based on an elliptical surface fit to the actual wave surface. The apparent velocities of the elliptical fit are then used to generalize the seismic parameters developed in Byun (1982). Simple numerical experiments are given to demonstrate the explorational significance of the theory. It is shown that the measurements of the normal moveout velocity are not sufficient to estimate the velocity structure of the transversely isotropic medium. The 'side-slip' effect can lead to significant errors in depth-mapping dipping reflectors.