

A TIME MIGRATION BEFORE STACK

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The 1970's saw the introduction and development of post-stack migration algorithms to the extent that migrated stacks were routinely produced as part of a basic processing sequence.

Similarly during the 1980's, we saw a proliferation of research and development of partial pre-stack migration operators, or Dip-Moveout (DMO). DMO is now almost universally employed in both 2D and 3D processing sequences.

As it well known, DMO followed by post-stack time- migration is not a complete substitute for a full pre-stack time-migration. In this discussion we will present a method for full pre-stack time-migration which offers the following features:

1. The method overcomes the limitations of DMO in the presence of lateral and vertical velocity gradients, symptomatic in areas of complex geology.
2. A velocity analysis procedure is inherent in the process. These velocities are derived along image rays and therefore more closely represent vertical rms velocities. Thus we benefit from having both a better migrated output with a commensurate increase in reliability and accuracy of our seismic derived velocity field.
3. The method is sufficiently robust and efficient to allow for routine processing of large volumes of seismic data.

We suggest that long before the turn of this decade, such pre-stack time migration strategies will be as commonly employed as DMO is today.