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DMO ACCURACY REQUIREMENTS FOR AVO ANALYSIS

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Dip-moveout (DMO) is commonly used in seismic data processing because of its proven ability to image events with conflicting dips and thereby increase lateral resolution in stacked data. Many different algorithms for doing DMO have been described in recent years, each achieving a different level of accuracy and efficiency. Hale (1984) described an accurate, but computationally intensive, algorithm cast in the frequency-wavenumber (f - k) domain. For efficiency, particularly when DMO is done in 3-D, algorithms have also been devised for doing DMO in the space-time (x - t) domain. In transforming Hale's operator from the f - k domain to the x - t domain, however, amplitude and phase approximations are made that impose accuracy limitations that may be unacceptable, particularly in light of interest in interpreting amplitude variations with offset (AVO).

Accurate x - t DMO is particularly important when it is done in 3-D (Hale, 1983; Beasley *et al.,* 1984). For 2-D DMO, in which the "processing unit" is typically a large group of traces, such as common-offset data or shot gathers, f - k DMO and other methods can be economical. Proper honouring of azimuthal variation in 3-D DMO, however, requires that *each trace* individually have DMO applied, and techniques involving transforms tend to lose their efficiency. For this situation, x - t algorithms are particularly cost-effective.

This paper suggests an x - t domain DMO that overcomes these difficulties. This method is based upon a reformulation of f - k domain DMO as a two-step procedure: normal-moveout (NMO) done with dip-corrected velocity, followed by an appropriate velocity-dependent dip filter (Jakubowicz, 1990). We first analyse the limitations of current approaches to DMO in the $x - t$ domain, then describe the new algorithm and compare its accuracy with that of alternative approaches to DMO.