Paper 18

Primaries at last — an innovative technique suppresses severe seismic multiples in the Kutei Basin, Indonesia

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An innovative new technique is effective at attenuating severe seismic multiples in the deepwater Kutei basin, Indonesia. Prior to this, primary reflections in the upper and middle Miocene zones of interest were completely

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obscured by a complex multiple wavefield.

Severe seismic multiples are generated by gas hydrate accumulations in the subsurface, by lithology variations in the sediments just below mud-line, and by free-gas trapped within these sediments. These multiples are 3D in nature, have significant diffraction components, are often non-hyperbolic, and can have an apex not located at the near-offset trace. A very difficult problem! Conventional multiple suppression techniques are not effective at attenuating these multiples. Advanced techniques such as High Resolution Radon and SRME have been largely ineffective.

An innovative new technique has proven to be effective at attenuating these multiples. The technique involves: 1) wavefield decomposition to separate all wavefield components; 2) raytracing to identify and flag components which are primary events; and 3) migration of the flagged primary events only. This technique excludes all non-primary events, regardless of complexity. Examples from the deepwater Kutei Basin Indonesia show the degree of improvement which has been achieved using this innovative technique.