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INTEGRATED ANALYSIS OF NINE-COMPONENT VSP AND SURFACE DATA: PRELIMINARY RESULTS

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Processing and interpretation of vector wavefield data recorded from multicomponent VSP and reflection seismic experiments requires careful analysis to provide maximum resolution of the anisotropic information content. This may be achieved by using a deterministic processing framework based upon a convolutional sequence of 3x3 matrix operators. Differential changes in the various components of the vector wavefield, such as $V_p/V_s$, $V_s/V_p$, and dim or bright spots between the $qS1$ and $qS2$ amplitudes, can then be determined.

We apply this strategy to nine-component (three component recordings of two shear sources and one compressional source) surface data and a nearby near-offset VSP acquired in the Paris Basin. The zone of interest is fractured carbonate in the Dogger formation. Various examples are presented for different stages in the processing, together with display and enhancement of the data through various stages of transformation. These preliminary results reveal the potential in mapping a fractured reservoir using multicomponent seismology.