VSP surveys are routinely acquired as a component of the exploration and development of a field or reservoir. VSP data contain information over and above that required for standard processing; information that is not usually fully exploited.

These otherwise underused data can be processed to image and position fracture/fault systems and geological features in 3D space.

The results can form an input to reservoir simulators thus increasing the value of the VSP data.

VSP 3D imaging extracts additional geological information, in the volume around the well(s) and fills the scale gap between wireline and surface seismic.

This provides a level of extra detail in the reservoir interval that was previously unavailable to the reservoir engineer.

Vibrometric’s VSP approach to 3D Fracture Imaging can use processed data, (archive or current), process newly acquired data or reprocess legacy data.
TOMOGRAPHIC VELOCITY ANALYSIS

A velocity model is inferred by Constrained VSP Tomographic Analysis, which offers a more stable solution and more representative of the geology than wireline sonic logs.

Along the well, the tomographic estimate appears as a smooth version of the sonic log. However, the far offset shots give also lateral extent to the velocity model.

Reliable velocity models are essential elements of the model-driven signal enhancement, noise cancellation and migration schemes.
State of the art software provides the capability to suppress noise and boost weak reflectors of any orientation, from horizontal layers to steeply inclined faults.

This processing also allows estimates of anisotropy to be determined and birefringence to be studied.
Our approach allows the 3D position and the orientation of the observed reflectors to be determined.

The results can be correlated with:

- image log interpretations, where reflectors intersect the well bore,
- interpretations of 2D and 3D surface seismic surveys, thus further improving the understanding of the structure of the reservoir.

Our leading edge processing technology allows the imaging of faults and fracture zones not resolved by conventional techniques.

The results of our 3D imaging extends well derived data away from the well bore, enhancing geological information critical to the accurate interpretation of well test data and so the understanding of the reservoir.

Statistical analysis can be undertaken and information on fracture connectivity, size distributions and geometries can be derived.

These results form inputs to Discrete Fracture Network models and reservoir simulators.