Spectral Voice Component for High Resolution Reservoir Description:

Spectrally balanced stack data can be subjected to complex spectral analysis, which has its own use like thickness identification with tuning frequency/amplitude. By making use of real component of the complex spectral analysis the voice components can be computed at different frequencies, which have the remarkable ability to reveal detailed reservoir architecture. Voice components can also assist in horizon correlation for noisy/complex seismic data and for thin beds where volume correlation may become confusing. Time slices generated from coherence volumes computed on voice components bring out high resolution lineament detail corresponding to faults and fractures, and other anomalous features at the reservoir level compared to the original input data. Such results can lead to more accurate interpretation.

DLBARG PETROLEUM PRIVATE LIMITED (DPPL) in technical collaboration with SamiGeo Consulting Ltd., Calgary, Canada offers this service for the Indian Clients. SamiGeo Consulting, where Mr. Satinder Chopra is the Founder and President, has developed the workflow and offers it globally.

For details of the process, the article "Spectral Decomposition and Spectral Balancing of Seismic Data" by Satinder Chopra and Kurt J. Marfurt; TLE, April 2016 may be referred.
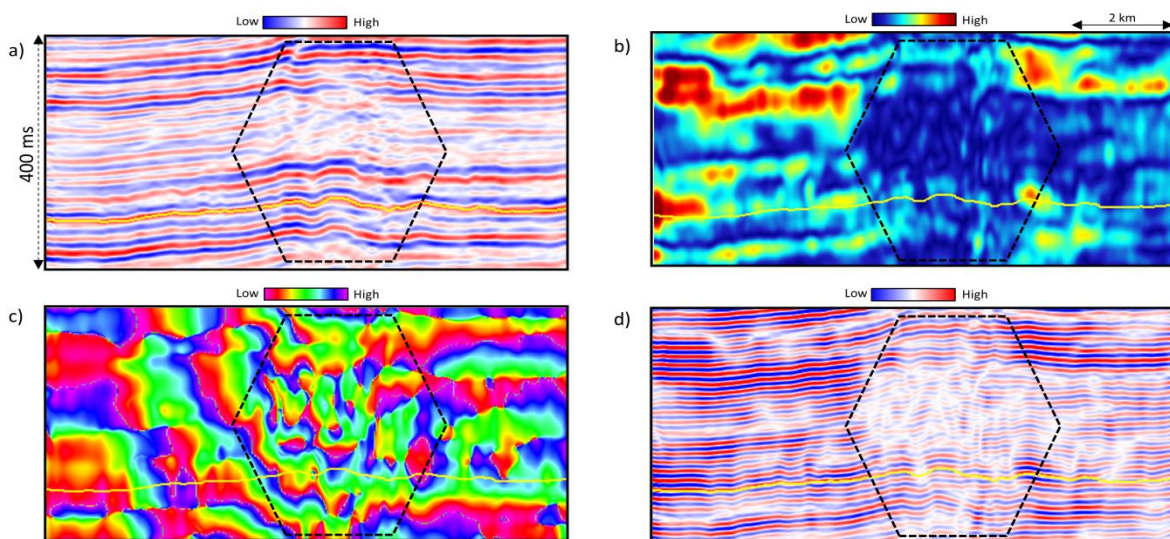
Please refer to the figures below for results.

Figure 1: Vertical slices through a) original seismic amplitude volume, b) 65 Hz spectral magnitude volume, c) spectral phase, and d) spectral voice component volume at 65 Hz. Notice the remarkable details of the vertical discontinuities in the highlighted portion of voice component display and to some extent in the phase component, but poorly seen in original stack data and in spectral magnitude.
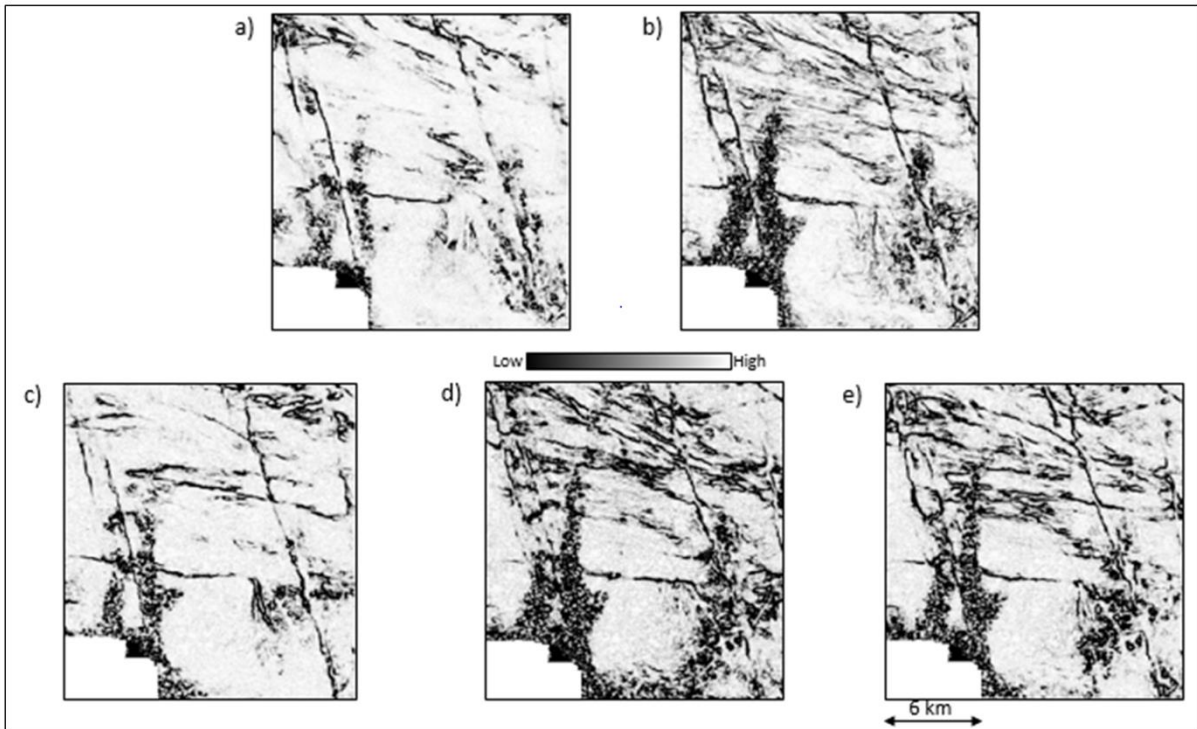
Figure 2: Time slices generated through the coherence volume from a) original Amplitude volume, b) spectrally balanced volume. c), d), and e) Voice component volumes at 65, 75 and 85 Hz. Spectral balancing and voice components have brought out high resolution lineament details compared to the original input seismic data.