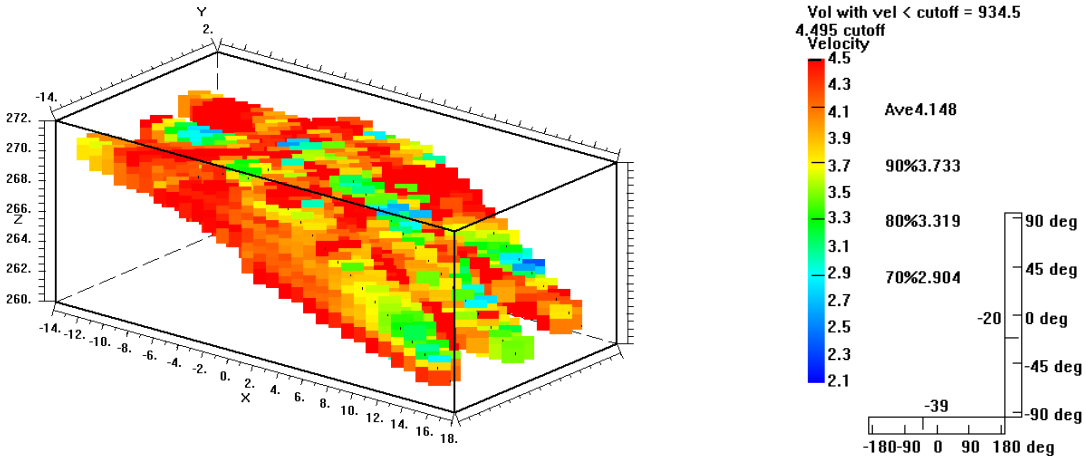
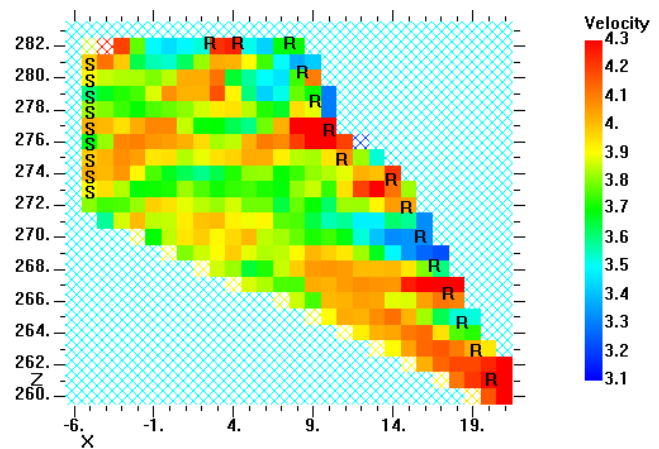


GeoTomCG Fact Sheet



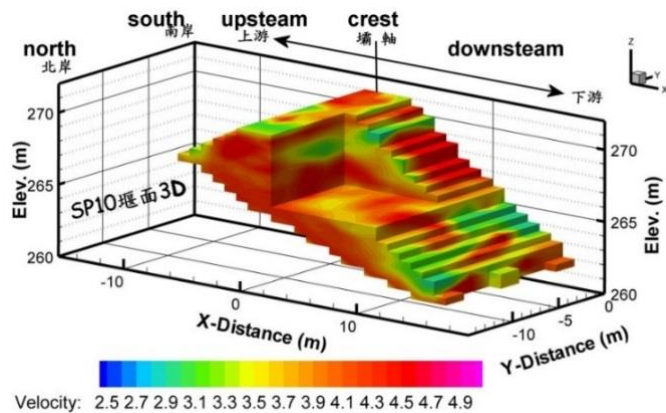
GeoTomCG can process and display 2D and 3D crosshole and VSP seismic or radar data. Sources and receivers can be anywhere within a 3D grid. These displays show calculated seismic velocities from a dam in Taiwan being investigated for earthquake damage¹. The upper display is a 3D image from GeoTomCG of the calculated velocities in the dam. The 3D displays can be rotated and tilted using the controls to the right of the velocity display. Low velocity zones inside a 3D volume can be displayed with a cutoff velocity.

On the right is a 2D slice from the 3D output with a narrower velocity range to reveal velocity variations more clearly. S and R indicate source and receiver positions, respectively. The crosshatch pattern indicates areas with few raypaths. The investigators reported that the seismic velocities were consistent with results obtained by other geophysical methods.



GeoTomCG can export results for display by commercial 2D and 3D graphics programs such as Surfer®, Voxler®, Tecplot®, and SlicerDicer®.

On the right is a 3D display of the results exported to Tecplot. Questionable locations are green-yellow, velocity 3.0 to 3.6 m/ms.



Benefits to users include:

- Reads input files from TomTime and a variety of other formats, so a user who already has time-picking software can continue to use it.
- User can apply quality control plots to detect possible errors in data.
- User can improve reliability of results by applying site information to constrain the inversion.
- Anisotropy can be included in the inversion.
- Best-fit velocity pattern can be displayed in 2D or 3D tomograms. 3D tomograms can be rotated and tipped. First-break raypaths can be displayed on 2D tomograms.
- Can perform forward modeling to help choose source and receiver positions and whether a zone of contrasting velocity will be detectable.
- Economical, \$600 (\$500 academic).

Forward modeling in which the traveltimes are calculated for a velocity pattern and source and receiver positions specified by the user can be performed conveniently. A basic velocity model can be generated, then editing options allow the user to specify any velocity pattern by drawing on a graphical display or by entering velocities for specified depths. The same editing options allow a starting velocity model for inversions to be generated that applies site information to constrain an inversion. Examples of constraints include maximum and minimum velocities and layering.

GeoTomCG is beneficial even for crosshole surveys in which the source and receiver are kept at equal depths. It provides more reliable determination of velocities because it allows raypaths to bend realistically into zones of higher velocity

¹Application of Elastic Wave Tomography for Dam Safety. Sheng-Hsung Hsieh, Chih-Hsin Hu, Chih-Hsien Hsieh, Jen-Kai Huang, Cheng-Yang Yen, Wen -Lung Chi, and Chao-Ming Lin. Presented at SAGEEP 2012, Tucson, AZ, USA, Mar. 25-29, 2012, Poster Session Two, Wed. Mar. 28. hsung@hckgeo.com.tw, H.C.K. Geophysical Company