

Tectonic landform analysis by digital photogrammetrical system and LIDAR

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The database of both precise locations and characters of active faults are obviously important for forecasts of earthquake occurrence and risk assessment. These database should be constructed on GIS (Geographical Information Systems), and the orthographic projected photographs are needed as the background map of the system. The orthographic photographs cannot be made without the precise DEMs (Digital Elevation Models), so it is essential to assess the accuracy of DEMs.

In order to provide the basic data of deformed landforms along the Itoigawa-Shizuoka Tectonic Line, we precisely produced the 10m-Mesh and 50cm-Mesh DEMs by using Digital photogrammetry workstation system and helicopter-mounted LIDAR (Light detection and ranging), and quantified the accuracy of the DEMs.

As a results, the error of DEM made by Digital photogrammetry workstation system can be minimized within several meters as one deviation, and the amounts of error have a clear relation with the brightness of aerial photographs. The active fault database should be constructed on the accuracy-assessed DEMs and orthophotos.

We surveyed at several points in the field with D-GPS to make GCPs (Ground Control Points) . If adequate GCPs are surveyed prior to the active fault generate earthquakes, we can detect the precise dislocation of the ground nearby the active faults. And we can check the accuracy of forecast of faulting and earthquake occurrence.