A Study of Integrated Monitoring of Active Faults and Earthquake Probabilities Analysis in Taiwan

Chien-Liang Chen, Yi-Jung Lin, Jin-Wei Hsu, Chih-Yen Chen, Szu-Ting Chen, Chii-Wen Lin

Central Geology Survey, MOEA

Abstract

In order to understand the crustal deformation pattern, analyze anomalies for earthquake precursor and realize the activities of active faults, the Central Geological Survey, MOEA has established an island-wide active fault observation network of GPS, precise leveling, borehole strainmeter, ground-water level and soil gas geochemical monitoring in Taiwan. We referred the experiences on earthquake probabilities model and tried to apply it in Taiwan to calculate probabilities for potential earthquake of active faults.

On the part of integrated monitoring data, we combined several GPS stations around active faults into triangles to calculate GPS strain and analyze the correlation between GPS strain and borehole strain. Furthermore, the GPS, precise leveling and PS-InSAR data were used to make velocity profiles across 33 active faults in Taiwan. On the part of earthquake probabilities analysis, this research evaluated the slip rate and slip deficit rate of active faults by 3D block model. The acquired data were provided to assess fault parameters, and calculated recurrence intervals and occurrence probabilities of active faults. Only if we continue implementing the survey project, we can turn the long-term geodetic data into useful information for disaster prevention and reduction.

Keyword: GPS, Leveling, Active Fault, Crustal Deformation, Probability