# Gravity analysis by Walsh transform and its application to Earth Sciences

# Akihiko Yamamoto[1]; Masahiro Yoshida[2]

[1] Ehime University; [2] Earth Sciences, Ehime Univ.

Analysis of an observed potential field anomaly in terms of its linear components has become popular in recent years. We performed gravity analysis using the Walsh transform to automatically extract known or unknown lineament structures around several focal areas. We applied 2-dimensional discrete Walsh transform to densely-distributed gravity data in Southwest Japan. In this study five regions are selected for the Walsh analysis, where a large earthquake occurred recently and earthquake faults are known to exist. The results show that gravity lineaments associated with earthquake faults can be successfully detected by the Walsh analysis. Specifically, the remarkably high Walsh outputs are found around the Atera Fault and the epicentral area of the 1984 Western Nagano Preecture earthquake. These results suggest that the Walsh gravity analysis is quite effective to detect known or unknown lineaments having very weak and linear Bouguer gravity changes, and is also applicable to mitigation science of natural disaster.