臺灣地區之磁感率異向性研究
Study of Magnetic Susceptibility Anisotropy in Taiwan

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Project description:

Since the anisotropy of magnetic susceptibility (AMS) was proposed as a tool to characterize petrofabrics and structure, the technique has been applied extensively to elucidate fabrics associated with sedimentary, igneous and metamorphic rocks. In this project we will use AMS as fabric indicator and finite strain marker to evaluate whether AMS is suitable tool for determining tectonic deformation and finite strain for the Taiwan orogen. We will core oriented samples across a larger section or a specific fault zone in the field. In the lab, principal directions and values of magnetic susceptibility ellipsoid will be measured. The relationship between magnetic foliation/lineation, which resulted from the principal directions of magnetic susceptibility ellipsoids inferred from AMS, and petrofabric foliation/lineation of mesostructure will be inspected. And the magnitude parameters of magnetic susceptibility ellipsoids will be used to illustrate the mean magnetic susceptibility and the degree of anisotropy, foliation, lineation, ellipsoid type and strain pattern, and also explore the relationships among these parameters. Besides, various experiments and methods, such as magnetic susceptibility, hysteresis loop, isothermal remnant magnetism, thermal demagnetization, optical/electron microscope examination, can be used to evaluate the magnetic source carrier(s) of AMS.

AMS is a widely applicable tool to explore petrofabrics and determine finite strain in a region. We expect that this evaluation of AMS applicability to the Taiwan mountain belt will be an important test before AMS is applied extensively to examine the strain pattern of Taiwan orogen. Beside the examination of characteristics of regional strain patterns, the principal directions of magnetic susceptibility ellipsoids should be able provide us insights into understanding of kinematics of Taiwan orogen.

Preferred background:

Students with field work experience are welcome.
Paleomagnetic knowledge is not necessary.
Knowledge of Excel and stereonet plotting is required.