

## Introduction

It has known that metamorphic rocks cover more than two-thirds of the area in Taiwan, and there would be brittle or ductile shear zones at the many boundaries between different lithologies. To clarify the aspects of shear zones, we'll use AMS & Magnetic Hysteresis Curve.

## Sampling Sites

In this project, samples were collected from the Hoping River (Fig. 1) and Central Cross-Island Highway (Fig. 2).

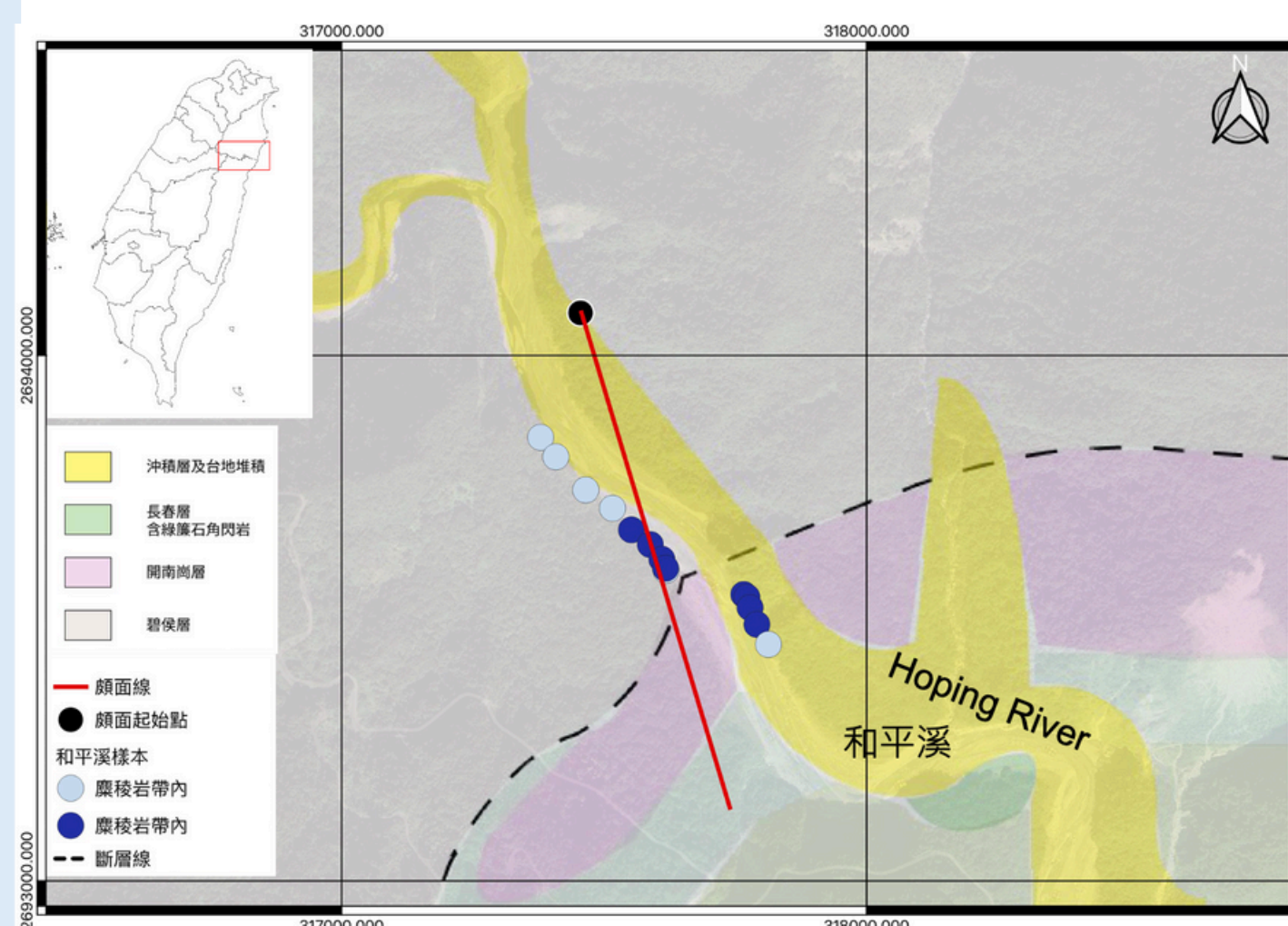


Fig.1 Sampling Site (Adapt from 焦中輝, 1991)

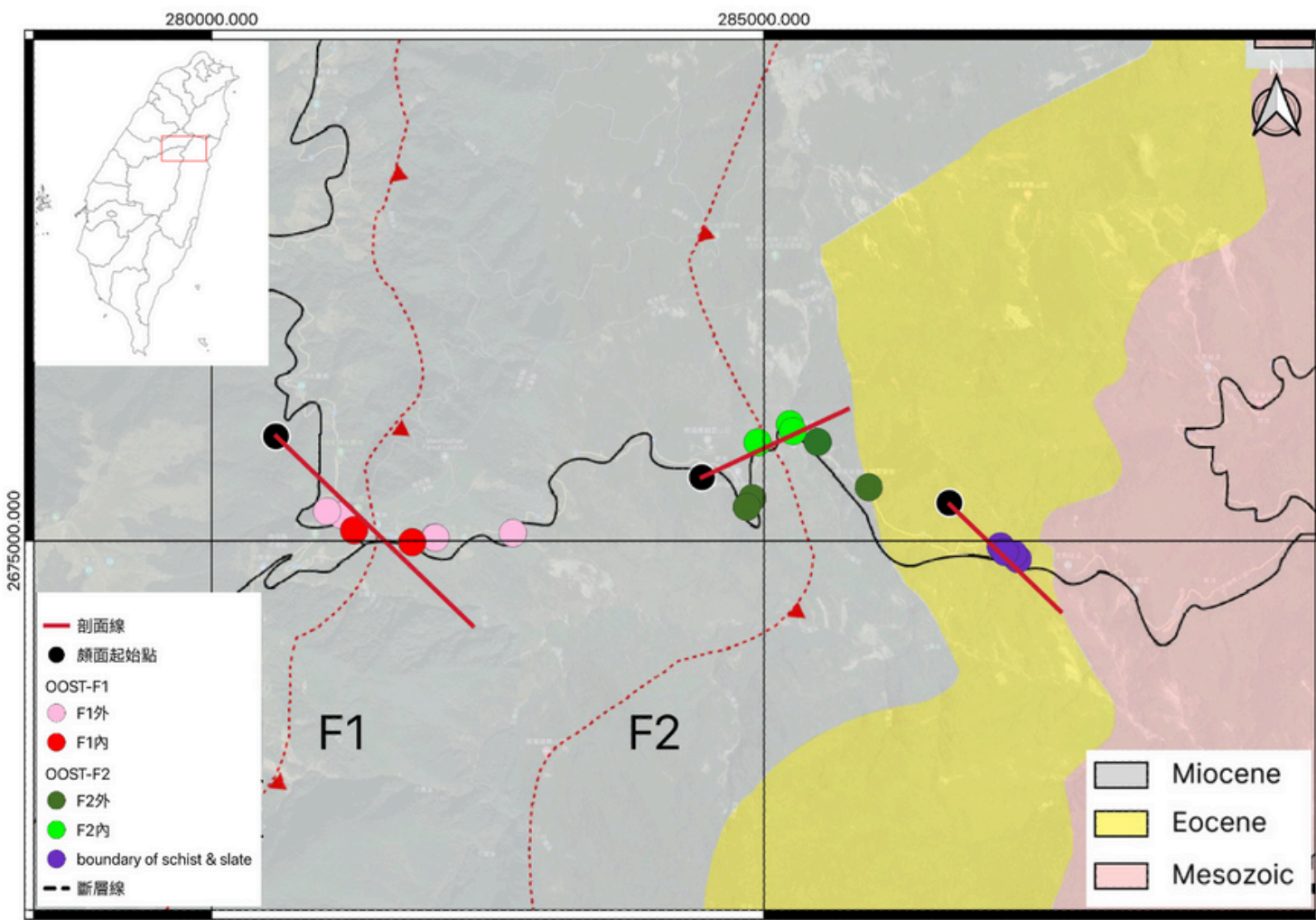


Fig.2. Sampling Site (Adapt from Lee et al, 2022)

## Methods

### 1. Magnetic Hysteresis Curve

- The method of measurement involves applying an external magnetic field to the sample and recording the induced magnetization. Different hysteresis phenomena are then used to distinguish the magnetic properties.
- Hoping River has 5 paramagnetic and 9 mixed samples (Fig. 3).
- CCIH are all paramagnetic samples (Fig. 4).

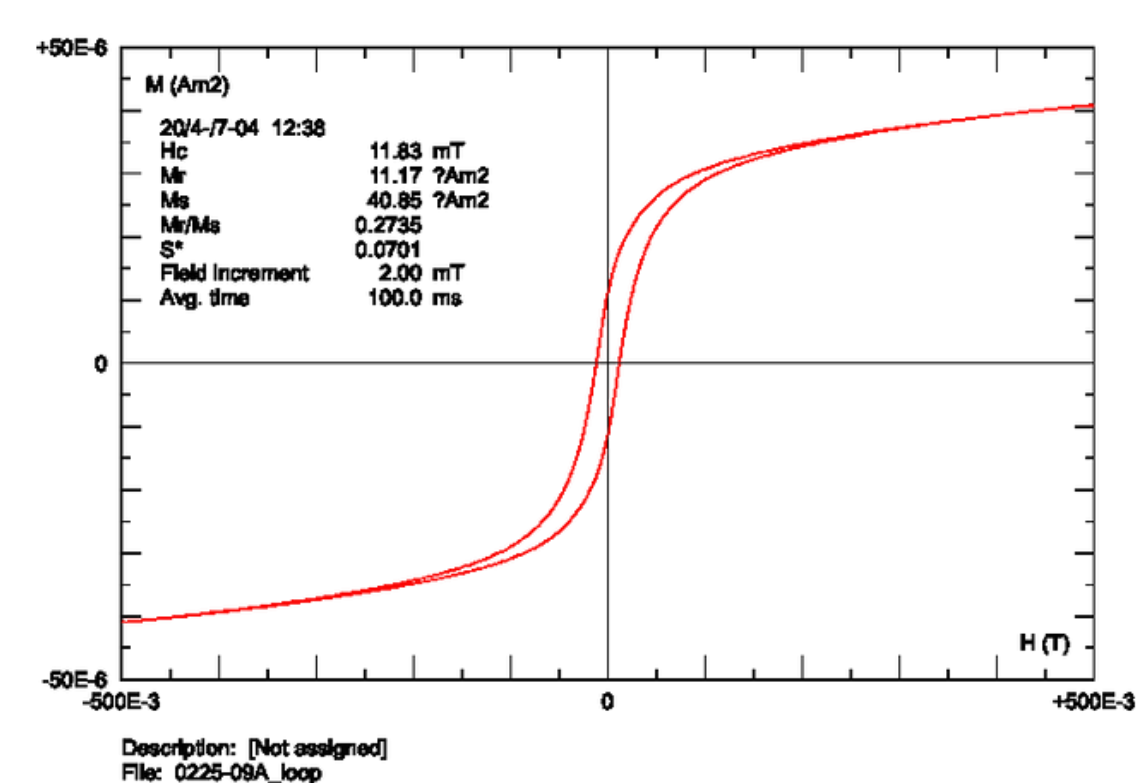


Fig.3 Result of mixed sample

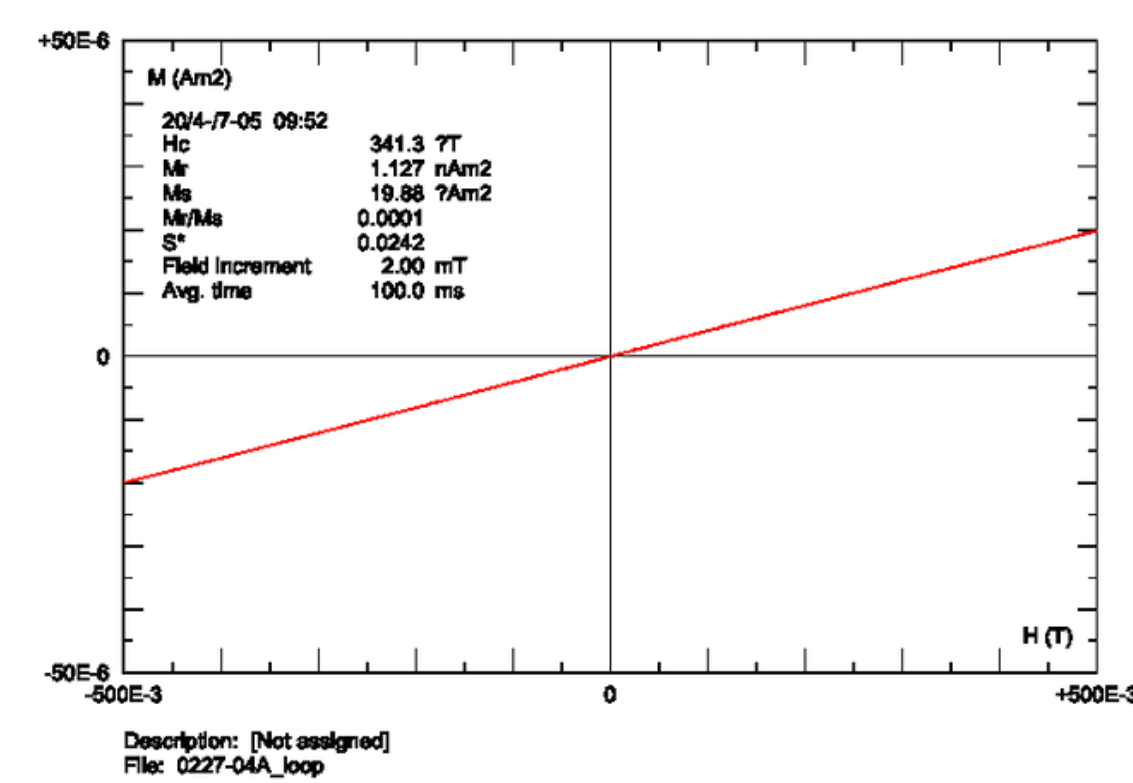


Fig.4 Result of paramagnetic sample

### 2. Anisotropy of Magnetic Suspectbility (AMS)

- When a material is subjected to an external magnetic field, it generates induced magnetization. By calculating the relationship between the induced magnetization and the external magnetic field, the magnetic susceptibility tensor (K) can be obtained. After K are determined, parameter can be calculated to draw diagrams such as Fig.5 & Fig.6.

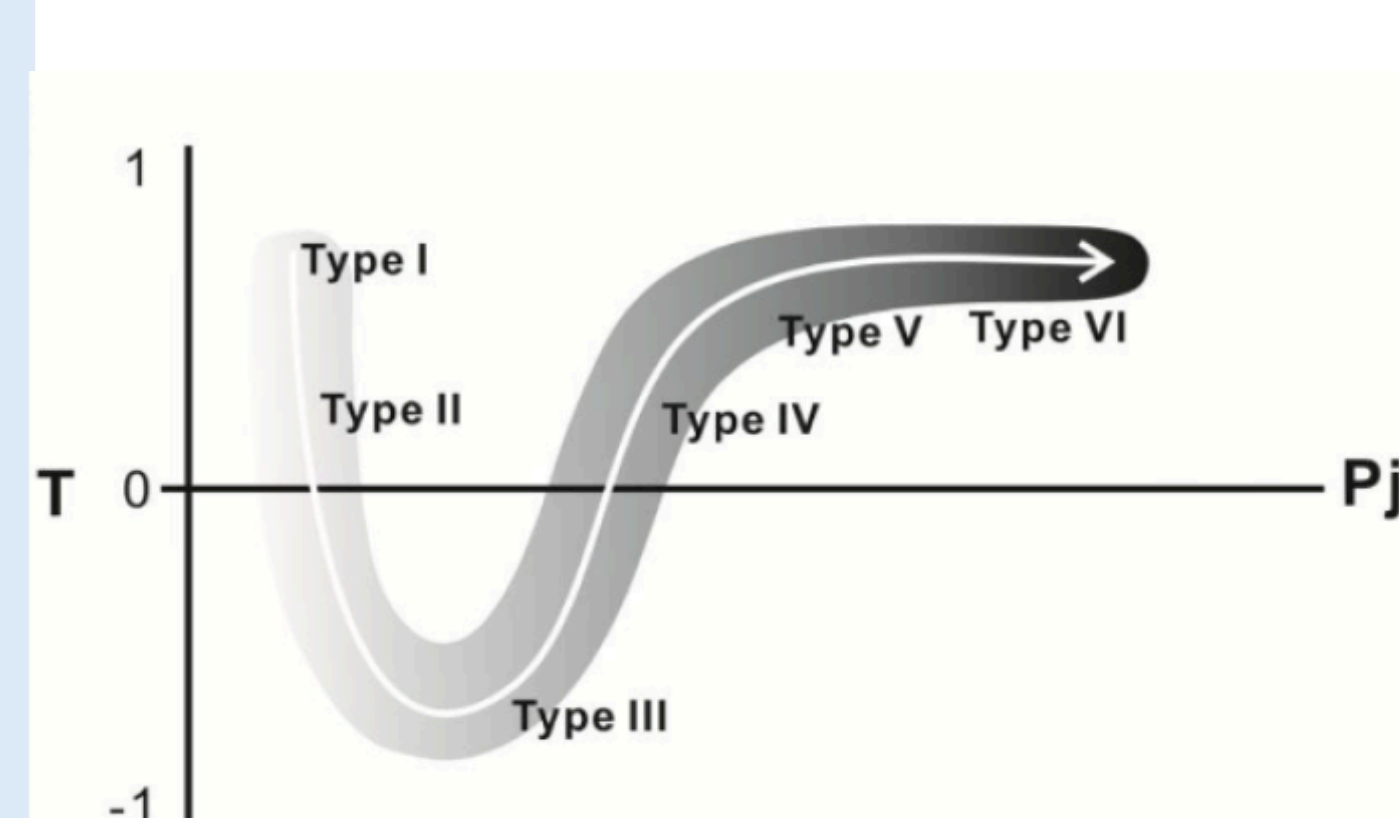


Fig.5 T-Pj Schematic diagram  
(彭筱君, 2015 adapt from Aubourg et al., 2004)

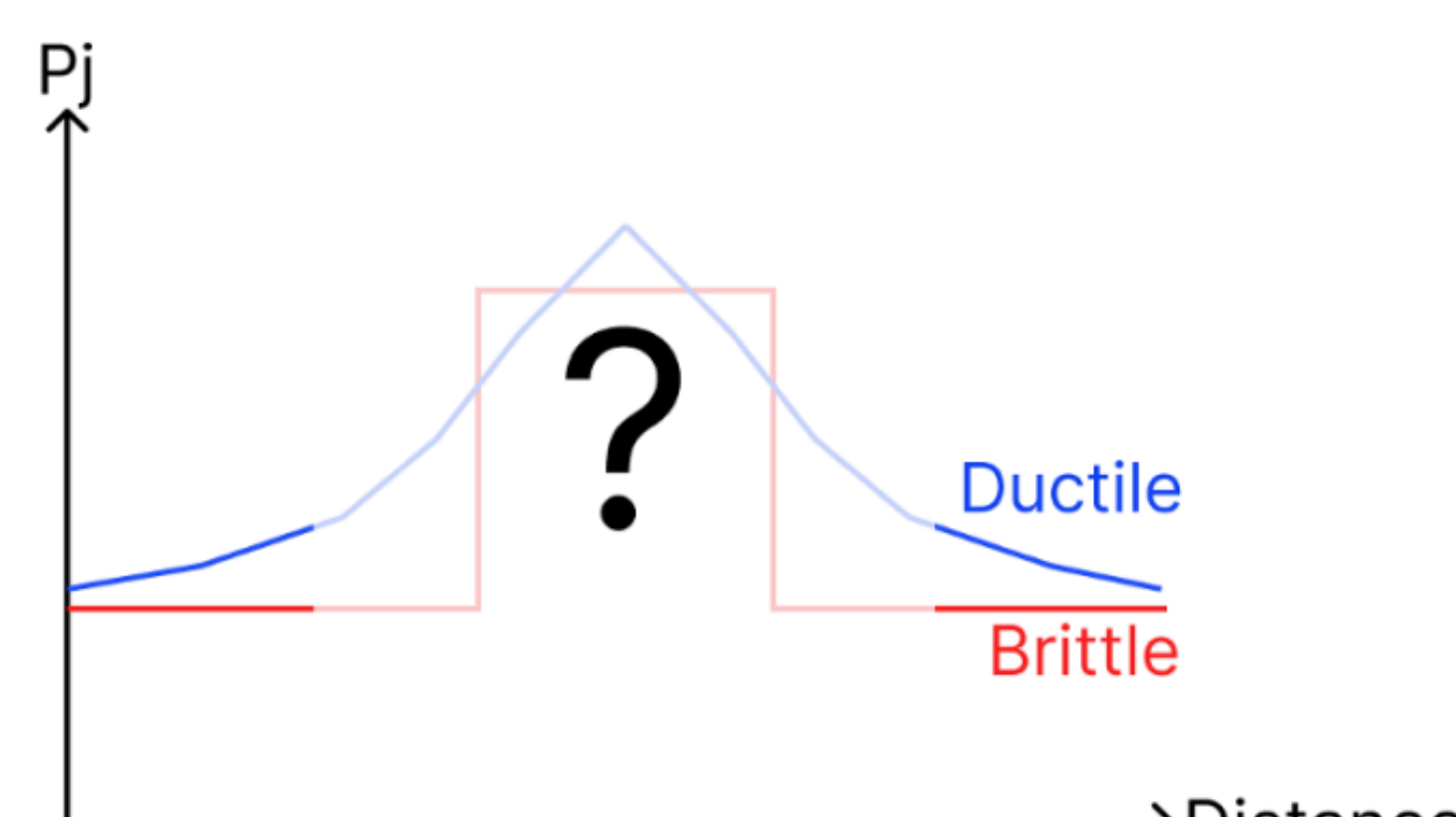


Fig.6 Schematic model across shear zones profile  
with different deformations

## Results

- The stereonet analysis of the magnetic susceptibility ellipsoid indicates that the magnetic fabric consistent with the orientation of the rock fabric (fig. 7).

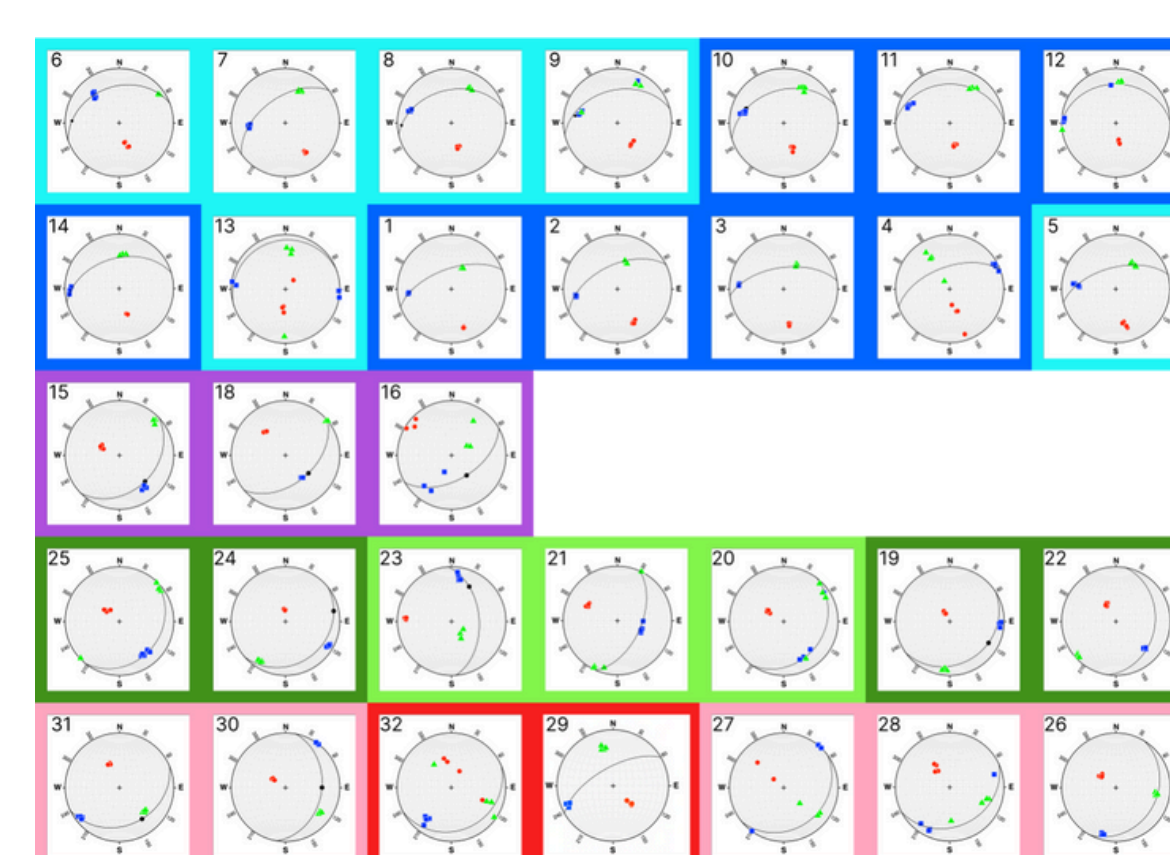


Fig.7 Streonets of full samples

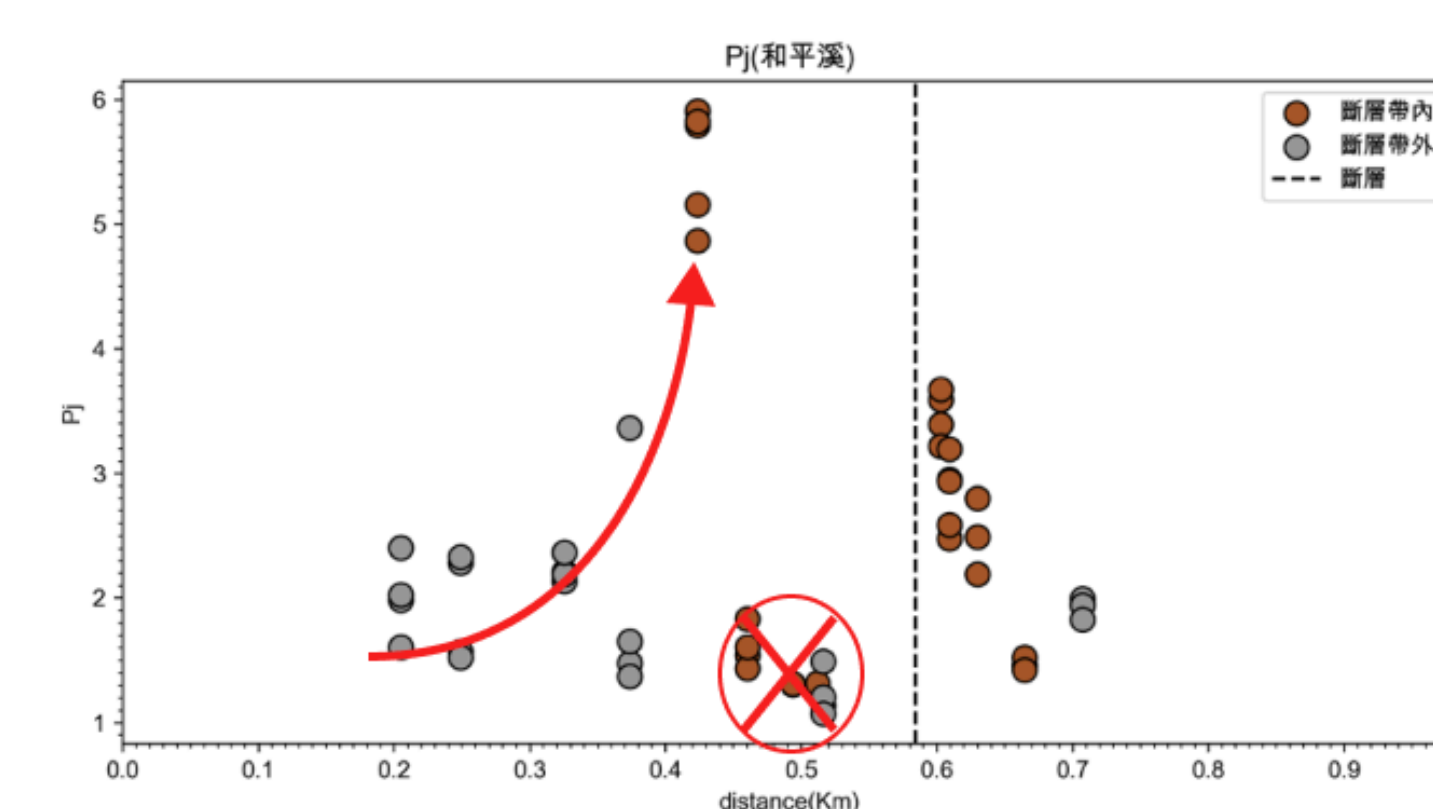


Fig.8 Across shear zone of Hoping River Pj profile

- In the hanging wall and footwall of the Hoping River shear zone, Pj exhibits a notable increase when closed to the shear zone (Fig. 8).
- In OOST-F1&F2, Pj decreases when get close to brittle shear zone, it could be caused by the second phase stress, D2 over print D1 (Fig. 9 & fig. 10).
- The trend of T-Pj in Hoping River (Fig. 12), might be the path continuously from the deformation evolution of the magnetic fabric (Fig. 12).
- T-Pj in CCIH, it should be type IV to type V and there's a similar trend with NCIH & SCIH (Fig. 11).
- T-Pj in CCIH, OOST F1& F2 have similar phenomenon to SCIH schist which is in the shear zone, Pj is lower when near the shear zone (Fig. 8 & Fig. 9).

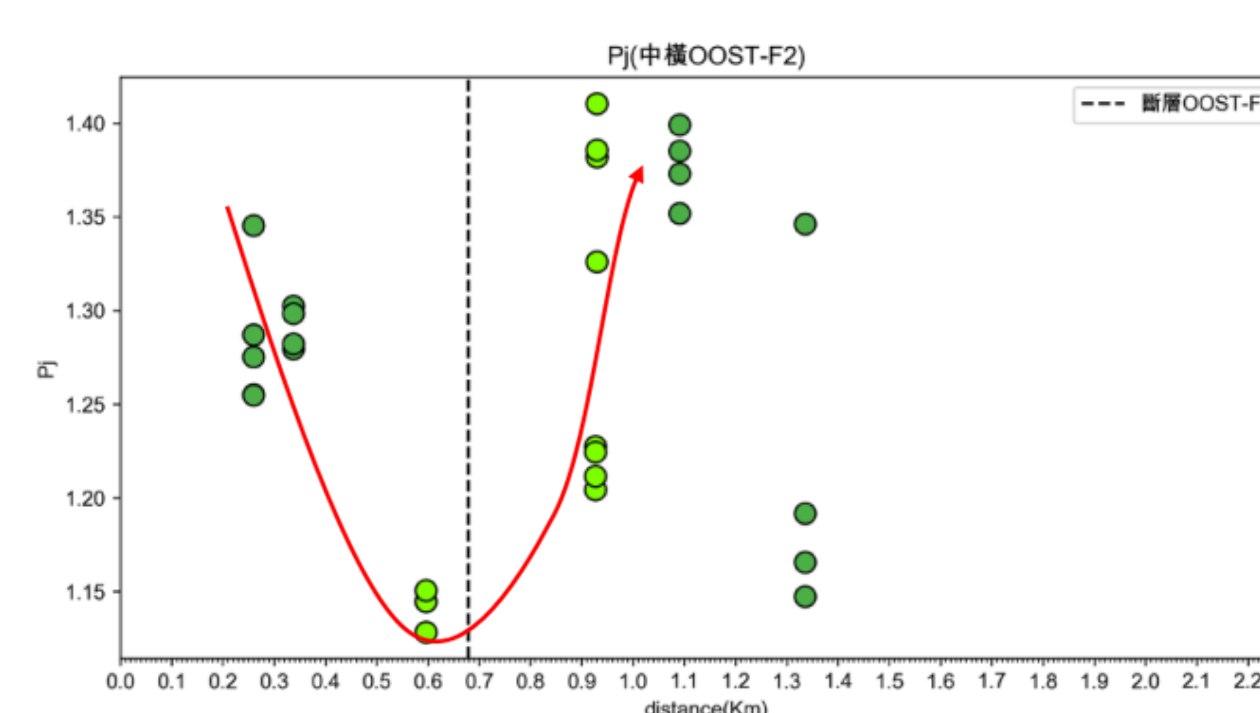


Fig.9 CCIH OOST-F2 Pj profile

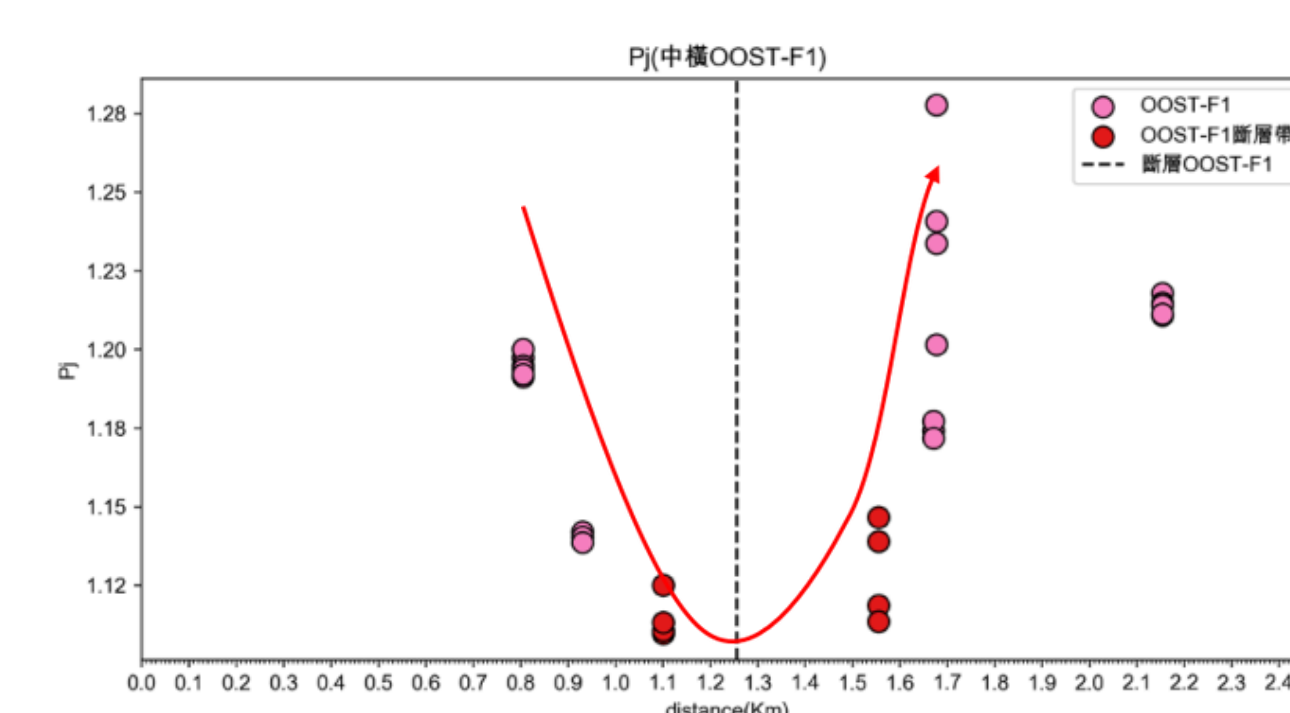


Fig.10 CCIH OOST-F1 PJ profile

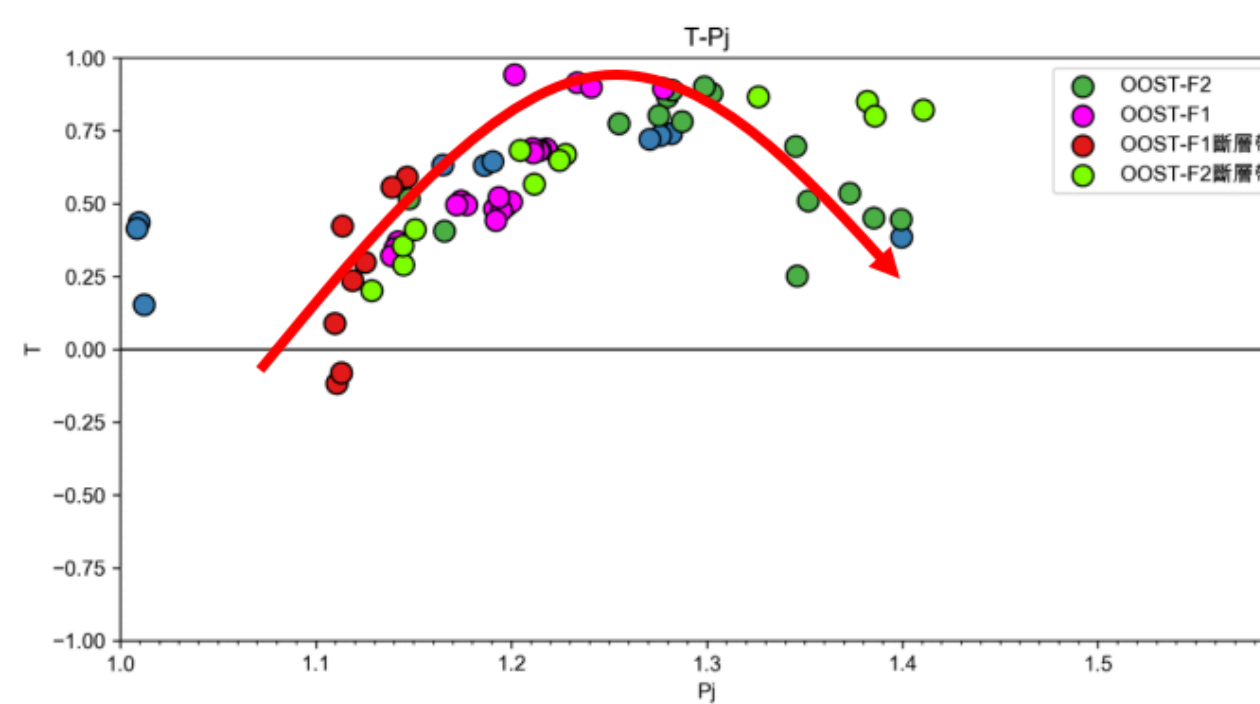


Fig.11 CCIH T-Pj diagram

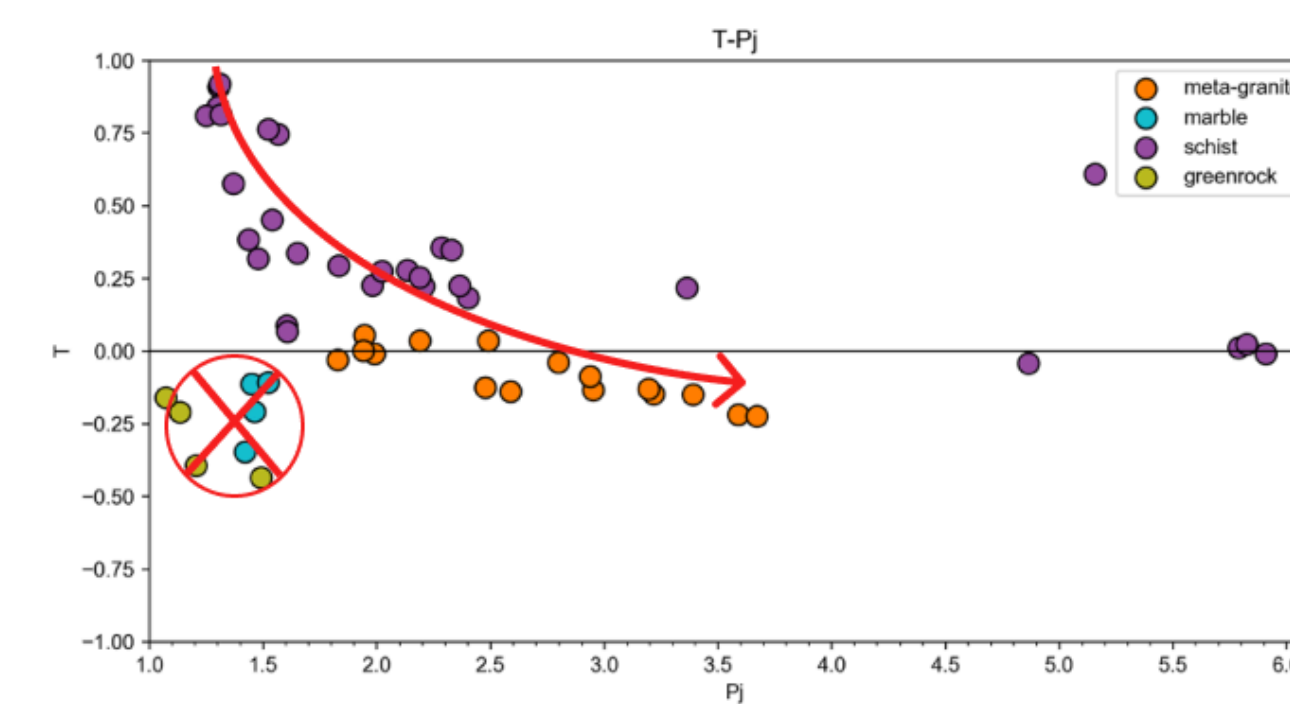


Fig.12 Hoping River T-Pj diagram

## Conclusions

- Magnetic fabric is consistent with the orientation of rock fabric.
- Hoping River correct anisotropy degree conform to our expect model.
- CCIH OOST-F1 & F2 has lower correct anisotropy degree when close to shear zone, it might be influenced by the second phase stress.
- Hoping River and CCIH has similar trend in expect T-Pj diagram.

## References

