

Deciphering the Tectonics of the Central Range (Taiwan) Through Metamorphic Geology

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There is a large controversy over the nature of the arc-continent collision that has been occurring in eastern Taiwan over the last few million years. How did the Eurasian continental crust respond to the collision with the Philippine Sea plate? When did the collision start? Was Eurasian continental crust subducted under the Luzon Arc? If so, how deep did it get? How long did it stay down there? When did it come back to the surface? How fast did it return? These are fundamental questions that are relevant to our understanding of plate interactions globally, in time and in space, particularly in relation to obduction of oceanic crust.

This talk highlights some of the ways we can use metamorphic rocks to address these tectonic questions. Of course all regionally metamorphosed rocks are the products of tectonic instabilities, one of loading and heating, and the other of unloading and cooling. Metamorphic geothermobarometers can help estimate the temperatures reached by metamorphism, and the pressures at that temperature. Thermochronology can be used to estimate the times and rates of cooling. Geochronology can help establish the times of mineral growth. The textures and fabrics of metamorphic rocks can help constrain the reactions that produce minerals, and can help discriminate between cooling and crystallization ages. This talk will be a progress report on what constraints we have on the thermal history of the crystalline rocks of the Central Range, and how we might build on these data to further constrain the thermo-tectonic history of this range.

References

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