The furious deformation of the Plattengneiss shear zone: A contributor to *P* and *T* in the eclogite type locality?

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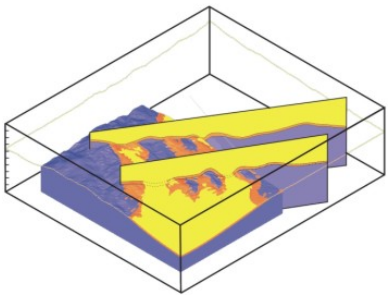
The Plattengneiss shear zone in the eclogite type locality is one of the largest shear zones of the Eastern European Alps. The metamorphic field gradient around the shear zone, its lack of equilibration during high grade Eoalpine metamorphism and its cooling history all point to the fact that its evolution must have been definitely furious and probably also fast. In our working group we have therefore studied its cooling- and strain rate, we have inferred its geometry and we have phantasized about its mechanical energy production as a potential contributor to the thermal energy budget of Eoalpine metamorphism [1-5]. This contribution summarizes some of our recent work.



In particular the lack of equilibration during the Eoalpine - despite metamorphism at 700°C - suggests that its evolution was either very short lived, or very dry, or both. Our study of the metamorphic field gradient around the shear zone shows that pressure changes of 10 kbar are associated with only 50°C drop in peak temperature - a relationship we call “negative themal perturbation function”. This gradient can be explained by invoking a non-lithostatic contribution to pressure - a scenario that can be tested if stress and strain in the shear zone are better understood. We currently therefore determine the vorticity of the shear zone using relative geobarometry. Vorticity and volume estimates are used to estimate the total mechanical energy budget of the shear zone and ultimately constrain the duration of its furious activity.

References

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