



FORM PER PROGETTI BANDO DOTTORATO XXXIV CICLO

1. Project title

Determination of P-T-t-d paths from lithospheric shear zones: links between deformation, magmatism and metamorphism

2. Proposer

MAINO	
MATTEO	

3. Research Unit

Surname	Name	Institution
MAINO	MATTEO	UNIVERSITY OF PAVIA, IT
LANGONE	ANTONIO	IGG-CNR, IT
SCHENKER	FILIPPO LUCA	IST - SUPSI, CH
SENO	SILVIO	UNIVERSITY OF PAVIA, IT

4. Key words

(Max. 5 – at least 2)

Shear heating; Thermochronometry; Shear zone; Structural analysis; Thermobarometry

5. Abstract

(Max. 1.500 characters with spaces)

Geodynamics of orogenic belts is commonly constrained by pressure and temperature estimates deriving from petrological investigations on metamorphic and magmatic rocks. However, significant deviations from the local geothermal gradients and/or the lithostatic pressure can occur due to heterogeneous rheology and strength of the rocks under tectonic stress. There is not consensus if these deviations are large enough or if they can be maintained enough to substantially modify the metamorphic reactions in the rocks and/or to produce melting.

We propose a structural and petro-chronological study to quantify the pressure-temperature-deformation-time (P-T-t-d) paths of lithospheric shear zones with the aim to investigate the possible P-T variations in time and space and their link with the strain field. The deformation pattern reconstructed by field mapping and structural analysis will be combined with a petro-chronological characterization. As the timing of each step is recorded by different domains of one or more minerals, in situ high-precision geochronology has a great relevance to accurately determine the paths. Besides the classic dating approach (U-Th-Pb on zircon, monazite, rutile) we will set up new protocols for dating other accessory minerals (allanite, titanite, xenotime, garnet) by using a new generation of ICP-Mass spectrometry that will be hosted at the IGG-CNR of Pavia. The study area is the Central and Southern Alps.

