



UNIVERSITÀ DI PAVIA

Corso di Dottorato in Scienze della Terra e dell'Ambiente

FORM PER PROGETTI BANDO DOTTORATO

1. Project title

Rates of tectono-metamorphic and magmatic processes within the lower continental crust from multi-mineral U-Pb dating

2. Proposer

Surname	Langone
Name	Antonio

3. Research Unit

Surname	Name	Institution
Piazolo	Sandra	University of Leeds – UK
Bruand	Emilie	CNRS Brest – France
Maino	Matteo	Università di Pavia – Italy
Sanfilippo	Alessio	Università di Pavia – Italy
Corvò	Stefania	Università di Pavia – Italy
Bonazzi	Mattia	Università di Pavia – Italy

4. Key words

(Max. 5 – at least 2)

Lower continental crust, metamorphism, deformation, anatexis, U-Pb dating

5. Abstract

(Max.1.500 characters with spaces)

The lower continental crust is mainly made of residual, anhydrous rocks (granulites), formed as consequence of upward migration of felsic melts, and migmatites from which melt has been extracted and/or eventually accumulated. The formation and migration of the melts toward upper crustal levels is responsible for the intra-crustal differentiation, the distribution of heat-producing elements (HPE; K, Th and U) throughout the continental crust and the enrichment of incompatible elements in upper crustal levels. The aim of this project is to characterize the rates of the tectono-metamorphic and magmatic processes experienced by the lower continental crustal section exposed in the Ivrea-Verbano Zone and Calabria. These lower crustal sections are exclusive places where is possible to study deformation processes occurred throughout the evolution of the crust up the final exhumation. The U-Pb dating of multiple accessory mineral (zircon and monazite, titanite, apatite, and rutile) will be applied in order to depict the P-T-t stages of the lower crust evolution. Trace element concentrations and isotopes in key, and still underexplored, accessory phases (apatite, titanite, monazite) will provide a tool to deepen our understanding of magma petrogenesis. The microstructural analyses of those petrochronological tools will allow to characterize the deformation events recorded by the lower crust during its evolution.