



UNIVERSITÀ DI PAVIA

Corso di Dottorato in Scienze della Terra e dell'Ambiente

FORM PER PROGETTI BANDO DOTTORATO

1. Project title

Dynamics of the crust-mantle transition zone from the United Arab Emirates ophiolite

2. Proposer

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4. Key words

(Max. 5 – at least 2)

lower oceanic crust, sub-oceanic mantle, hydrous magmas, magmatic amphibole, Semail ophiolite

5. Abstract

(Max.1.500 characters with spaces)

The United Arab Emirates ophiolite is a pristine natural laboratory to define the large-scale processes controlling the melt transfer from the upper mantle to the oceanic crust. The present PhD project wishes to delineate the structure, composition and dynamics of the mantle-crust transition zone from this ophiolite. In the transition zone, a nearly anhydrous sequence made up of dunites, troctolites and olivine-gabbros, classically believed to be genetically related to mid ocean ridge-type basalts, is crosscut by an intrusive sequence consisting of amphibole-bearing wehrlites, clinopyroxenites and gabbros, as well as by biotite-bearing tonalites and two-mica peraluminous granites. The parental melts of the discordant intrusive sequence are thought to have a high H₂O content, but there is not a consensus about the H₂O origin. The hydrous melt signature might reflect a contribution of a subducting slab into a mantle wedge source, or be related to downward tectonic transport of seawater-derived fluids into a mid ocean ridge-type magma chamber. The PhD project wishes to provide a comprehensive overview on the processes leading to the compositional heterogeneity of the melts involved in the building of the mantle-crust transition zone of the United Arab Emirates ophiolite. The objective will be pursued based on an innovative methodological approach that integrates field-based investigations and petrological-geochemical studies.