

Kinematics and deformation structures in a crustal-scale shear zone on Kea (W. Cyclades, Greece) *Poster*

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It is generally agreed upon that the exhumation of metamorphic rocks in the Aegean is caused by post orogenic extension in the late Oligocene to early Miocene. This extension is in principle largely accommodated by low-angle crustal detachment faulting possibly resulting in the formation of metamorphic core complexes (MCC).

Here, we present data from recent structural investigations on the island of Kea in the W. Cyclades, Greece. Our work focussed in the north of the island. Of the ca. 270 m total structural thickness that was mapped, the entire section of rocks are highly strained. Exhumation during progressive deformation is recorded by the transition from ductile to brittle/ductile to brittle conditions. The regional characteristics and types of deformation structures vary depending on the protolith and the intensity of strain.

The lower portions comprise albite blast-bearing greenschist gneiss that becomes intensely folded structurally upwards and then changes through increasing strain and decreasing temperatures into a fine-grained greenschist-

bearing internal gneiss lamellae.

This central unit of fine-grained greenschist comprises a series of interlayered cm- to m-scale marbles and compositionally varying schist layers. These host structural features such as macroscopic S-C fabric, lensoidal to angular boudins. All sections are overprinted by polyphase brittle/ductile to brittle deformation. Also present are brittle fault zones that are concentrated on rheologically-distinct weak layers. These layers often contain serpentinite lenses and talc. Additionally, cataclasites with slickensides and Riedel-fractures are present in these zones. A high density of syn-post mylonitic quartz veins are present as well as distinctive ultramylonite (graphitic) shear zones testifying diffusive mass transfer and solution/precipitation mechanisms during deformation. Late stage fluid-related activity resulted in alterations and mineralizations including a conspicuous ankeritization of dolomitic megaboudins.

The uppermost portion comprises a 10's m thick marble-ultramylonite with dolomite lenses at its base that forms very coherent km-long blocks. The competency contrast between the marble-ultramylonite layer and the underlying fine-grained greenschists is frequently marked by a metre-scale zone of very high strain as indicated by the presence of sheath folds. Within the marble-ultramylonite, a-type flanking folds represent the last stage of deformation.

The lineations show a NNE-SSW-direction on mostly NE-dipping foliation planes (with an average dip of 30°). All ductile (SC' or SCC', clasts with monoclinic symmetry, shear bands, SPO and LPO in quartz mylonites), brittle/ductile (rotated veins, flanking

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structures, asymmetric boudinage) and brittle (Riedl fractures, slickensides) shear sense indicators show a consistent top to SSW direction. Although the low-angle fault system in the northern part of Kea has the current orientation of a thrust, in analogy to other metamorphic core complexes (e.g. Serifos) we speculate that the fault zone is part of an up-warped extensional crustal scale detachment.

The low-angle extensional faulting related structures are overprinted by younger and possibly still active steeply dipping conjugate fault zones, which strike NNE–SSW and NW–SE respectively. A possible regional genetic link with the actively widening Gulf of Corinth is subject of further investigations.