

Preliminary results constraining the kinematics of subduction and exhumation processes on Skopelos island, Northern Sporades (Aegean Domain)

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1992), while the Palouki unit has not been substantially compared and connected to any regional structural unit so far.

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Geodynamic interpretation Structural analysis • **F**₁ Isoclinal folds (40) $_1$ - isoclinal folding (**F**₁) and formation of penetrative foliation (**S**₁) association (**S**₁) as so (**S**₁) as (**S**₁ astward subduction should lead to top-SW ductile shear in the sub naterial, which is now supported by our observations and measurements as well. F2 inclined-recumbent fold axes • F2 upright fold axes (53 possible position of Skopelos s Cycladic basme r Pelagonia F Structural model for D₂ Extension and exhumation of metamorphic rocks in the Aegean have been driven by slab rollback since 45 Ma (Brun et al., 2007). It has been shown, that subduction of continental blocks triggers slab rollback, thus the subduction of the Pelagonian block is a possible driving factor of the initiation of extension and exhumation in Rhodope (Brun and Faccenna, 2008) D_2 - the structural style of the second phase of deformation is characteriz Exhumation means southwestward movement of the Pelagonian with by features representing intensive NE-SW stretching associated with respect to Rhodopia which is represented by characteristic top-NE-E shear NE-E sense of shear (F2 sheath folds trending parallel with the stretc sense indicators and small shear zones on the island of Skopelos ineation, assymetric and symmetric boudinages, C-S and C-C` structur partly coeval NW-SE shortening evidenced t onsistent observation and measurement of ductile upright folds with NEponent of NW-SE shortening during the exhumation of the bortening of previously tilted limbs of upright folds. The axes of recu formations.Simultaneous stretching and shortening has already been inclined folds depend on the dip direction of the steeply tilted foliation proposed in case of the Cyclades (Avigad et al., 2001) cases they are roughly parallel with the stretching direction) NE-E shear localized at narrow zones of highly contrasting competence Progressive exhumation by top-NE-E extensional unroofing brought the ed by pre-existing stratigraphic (or tectonic) contacts between rocks in the zone of brittle-ductile transition as evidenced by semi-brittle lithologies. Deformation is largely taken up by the weake structural features which are basically the low-temperature variants of the lithologies. Typical greenschist facies minerals (chloritoid, chlorite ductile features shown by the D_3 -structural model drawing. Instead of ductile crystallized mainly syn-kynematic to top-NE-E shearing. D₂ shearing partly occured along S1 foliation surfaces and partly created a new mylonitic shear bands semi-brittle normal faults formed; instead of close-tight upright foliation that usually closes a small angle with S1. folds, open-gentle upright folds and kink bands formed. Estimation of paleostress axes based or three conjugate sets of kink bands (e Naha and Halvburton. 1974). The estimate at least provides an idea at the orientation of the principal stress a when the formations of Skopelos w exhumed not much above the dept the BDT. The roughly NW-SE contraction had already been present below the BE s evidenced by ductile upright folds hus the results derived from t conjugate kink bands seems valid. Two dominant dip directions (NW and of normal faults imply changing direc vere exhumed above the B Based on our dataset he relative age of the NW-SE Dominant orientation of liocene-present-day stress



normal fault 🛛 🤜 dextral fault The North Aegean Trough (NAT) is a major sedimentary basin in the Aegean with sediment hat the NAF did not control the early evolution of the NAT, it rather reactivated it as a zone accomodationg the westward motion of Anatolia. The Skopelos fault is also likely to be a pre-Pliocene structure since it seems to control the deepest depression of the pasin system filled with Miocene to Quaternary strata. The Skopelos fault is no longer active,

since the island is presently subsiding in the footwall (Evelpidou, 2013). The youngest

structures on the island are contractional and transpressional - as shown by the D3b figures. In

our interpretation map-scale gentle folding and the reactivation of pre-existing, originally top-

SW nappe contacts belong to the Pliocene-Quaternary propagation of the NAF into the NAT.

INE-SSW extension and perpen the NAF in the NAT and resulte (re)activation of thrusts and formation of dextral faults on Skopel (e.g.Chatzipetros 2013,Sakellarious 20