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Geometric description and analysis of metamorphic tectonites (Pelagonian Zone, Internal Hellenides, Northern Greece)

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An assortment of alpine and pre-Permian metamorphic tectonites, belonging to the Pelagonian Zone of the Internal Hellenides, are analyzed from Askion, Vernon and Vorras mountains. They in fact compose the Upper plate of the Western Macedonia core complex, overlying Late Tertiary high-P rocks through large-scale detachment fautls (Diamantopoulos et al. 2007). This work wants to determine the architecture and the kinematic path of rocks in a 3D assumption. Field analysis concludes: a) Meta-sedimentary lithologies and amphibolites, meta-igneous lithologies, granitoid mylonites composed of augen fieldspar gneisses, Permo-Triassic fossiliferous rocks, meta-carbonates of Triassic-Jurassic age, a Jurassic mélange including meta-sedimentary lithologies, serpentinites and carbonate tectonic blocks, Mesozoic Ophiolites, Cretaceous limestones and conglomerates as well as flysch sediments compose the architecture of the study area, b) Multiple high and low-angle cataclastic zones of intense non-coaxial strain separate distinct pre-Permian lithologies, alpine from pre-alpine rocks, Triassic-Jurassic rocks from Permo-Triassic rocks, Jurassic mélange from flysch sediments, Jurassic mélange from Triassic-Jurassic rocks, Cretaceous rocks from the Jurassic mélange, Cretaceous limestones from flysch lithologies and Cretaceous rocks from serpentinites, c) Geometric analysis and description of asymmetric structures found in fault cores, damage zones and in the footwall-related rocks showed a prominent kinematic direction towards WSW in low-T conditions affected all the rock lithologies, d) Multiple S- and L- shape fabric elements in the pre-Permian and Permo-Triassic rocks appear an intricate orientation, produced by intense non-coaxial syn-metamorphic deformation, e) Sheath and isoclinal folds oriented parallel to the L-shape fabric elements as well as a major S-shape fabric element, producing macroscopic fold-like structures compose the main syn-metamorphic fabric elements in the pre-alpine tectonites, f) Discrete and distributed strain along the former boundaries and within footwall- and hangingwall rocks is connoted to control the bulk kinematic path of the involved sequences, g) Field evaluation of the structural geology and the tectonics connote the conjugate character of the cataclastically-deformed boundaries, causing overprinting of the pre-existed ductile-related geometries, h) For the age of the inferred WSW kinematic direction of the involved rocks we believe that it is closely associated with the tectonic superimposition of the Pelagonian Zone onto the Olympos tectonic window during post-Late Eocene times. Miocene to Quaternary faulting activity in all the scales overprint the above Late Tertiary perturbation, resulting a real complicated structural feature (Diamantopoulos 2006).

Diamantopoulos A., 2006. Plio-Quaternary geometry and Kinematics of Ptolemais basin (Northern Greece). Implications for the intra-plate tectonics in Western Macedonia. Geologica Croatica 59/1, pages 85-96.

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