

ANALYSIS OF SOME MECHANISMS EXPLAINING FAULT SPACING IN EXTENSIONAL ZONES

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An interesting question which arises with sets of parallel faults in the extensional zone of the gulf of Corinth is that of fault spacing. Faults may be considered as a localisation process in the shallow brittle crust. A first mechanism for fault spacing is analysed as the result of the subsequent activation of shear bands formation and stress redistribution in the medium (Lesniewska and Mroz, 2000). In that case, it is shown that the distance between the subsequent fault is controlled by the thickness of the crust and the softening behaviour of the material inside the fault in due course of the sliding process. An other mechanism based on the assumption that the localisation process of the brittle upper crust is triggered by folding instabilities of the lower ductile layer is also studied. In that case fault spacing is controlled by the selected wave length of the buckling mode (Fletcher and Hallet 1983). Based on the simple model of a top layer gliding on a bottom layer, buckling of the lower ductile layer under simple shear is analysed. Selection of a dominant wave length arises as the result of several competing length scales. The vertical distribution of applied stresses, the mechanical properties of the overburden and the detachment layer, the thickness of the overburden and the substratum, the fluid pore-pressure are the key parameters that control the selection of the instability mode (wave-length with the fastest growth rate). Fletcher R.C., and Hallet B. (1983). Unstable extension of the lithosphere: A mechanical model for basin-and-range structure, *J. Geoph. Res.*, 88, B9, 7457-7466. Lesniewska, D. and Mroz, Z. (2000). Limit equilibrium approach to study the evolution of shear band systems in soils, *Géotechnique*, 50, 5, 521-536.