

LOCAL AND FAR FIELD STRESS - EXAMPLES FROM THE EASTERN AND SOUTHERN ALPS, EUROPE

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Stress fields are deduced from the study of brittle deformation in single outcrops. If results are regionally consistent, regional stress fields are proposed. However, usually it is impossible to decide, whether the observed stress fields represent local or far field stresses. Post-collisional brittle deformation in the Eastern and Southern Alps is well studied and provides examples for all types of local stress fields. The far field stress is deduced from deformation in both the Northalpine and the Southalpine Molasse Basins, that display uniform NNW-SSE shortening. Local stress fields are the result of: 1) Escape movements: Intense shortening in front of the overriding plate led to vertical and horizontal extrusion of material. Triangle shaped blocks of crust moved away from the zone of maximum shortening, delimited by steep faults. The movement of these blocks controls a local stress field along its margins. 2) Rotational movements: The anticlockwise movement of the upper plate exerted a drag on the thin-skinned frontal nappes that had already been thrust onto the foreland, leading to clockwise rotations of these nappes. Older faults and stress fields are as well rotated. 3) Interference patterns with other orogens: The Southern Alps are located in the hinterland of both the Dinaric orogeny and the Alpine orogeny (east and north of the present Southern Alps, respectively). During the Late Eocene E-W Dinaric and NNW-SSE Alpine stresses interfered. Cessation of the Dinaric orogeny led to successive rotation of the stress field to an Alpine direction.