Geophysical Research Abstracts,
Vol. 10, EGU2008-A-01426, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-01426
EGU General Assembly 2008
© Author(s) 2008

Stress heterogeneities induced by fault slip in unconsolidated gravel layers (SE Vienna Basin, Austria)

C. Tuitz, U. Exner and B. Grasemann
Department of Geodynamics and Sedimentology
University of Vienna, Austria
(christoph.tuitz@univie.ac.at)

The Vienna Basin is a pull-apart basin, which developed as a consequence of the Oligocene/Miocene extrusion of the central Eastern Alps extruded towards the E along sinistral NE-SW and dextral NW-SE-striking strike slip faults. Extensional tectonics in unconsolidated sediments of the Neogene Eisenstadt-Sopron Basin, a subbasin of the Vienna Basin, resulted in the generation of conjugate sets of SW and predominantly NE-dipping normal faults. The sequences hosting these faults were deposited during the Sarmartian and Pannonian and are successions of deltaic gravels with intercalations of shallow marine calcareous sands.

In a gravel pit south of St. Margarethen the extensional fault predominantly localize in meter-thick, well-rounded conglomerate layers, which were more competent than the under- and overlying sands. Within this matrix-free, clast-supported conglomerate layers, the up to several centimetre-large pebbles record point contacts, which are either marked by solution pits and/or meniscus cement. Some pebbles are deformed by brittle fractures radiating from the points of contact probably caused by contact stresses. Interestingly, these fractured pebbles are observed only in the quadrants near the fault tip, where the mean change in compressive stresses is positive (i.e. the pressure is higher). Based on this observation and the information that the overburden of the unconsolidated sediments never exceeded more then a few hundred meters, we

conclude that the cracking of the pebbles was a result of fault slip.

We used the boundary element program Poly3D in order to model stress distribution around structurally mapped natural faults and compare the results with the distribution of cracked pebbles in the conglomerate layers.