Geophysical Research Abstracts,
Vol. 10, EGU2008-A-01404, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-01404
EGU General Assembly 2008


# Geological and archaeoseismological evidence of neotectonic activity in the Fethiye-Burdur Fault Zone (Eşen Basin, SW Turkey)

**B. Yerli** (1), J.H. ten Veen (1) and M. Sintubin (2)

(1) Institute for Geology, Mineralogy and Geophysics, Ruhr University Bochum, Germany, (2) Geodynamics & Geofluids Research Group, K.U. Leuven, Belgium (baris.yerli@rub.de)

The Fethiye-Burdur Fault Zone (FBFZ) in southwestern Turkey forms an important, but only moderately well studied lineament connecting three tectonic provinces. Each of these are characterised by different processes associated with the incipient and imminent collision of tectonic plates in the Eastern Mediterranean. The FBFZ is regarded as a single tectonic element, based on the linear arrangement of individual faults, some of which showed recent seismic activity. Despite this almost unquestioned notion, there are a number of uncertainties that regard the origin and orientation of fault segments, the fault kinematics and the age of activity of individual segments. Within the FBFZ, the Eşen Basin formed as a ca. 15 km wide and 30 km long, N-S trending graben. Our study of this basin builds on information from the geological, historical and recent time scales and as such aims at reconstructing the full basin evolution.

A structural analysis in combination with tectonosedimentary information infers that during the Late Miocene - Pliocene, E-W extension caused the development of N-S normal faults along which basin-margin alluvial fans were deposited in a lake environment. In the Pleistocene the faulted basin margin became segmented by a system of NE-SW trending normal faults. Subsequently, the Mio-Pliocene fault-block tilted basin fill was unconformably overlain by Pleistocene alluvial fan deposits that were sourced from broad NE-SW fault-related valleys transecting the original basin margin. The nowadays terraced Pleistocene conglomerates are segmented and back-tilted through continuous activity of these NE-SW faults in younger Quaternary times. His-

toric activity of these faults is inferred from earthquake-induced damage to the Lycian (Hellenistic- Roman) city of Pinara. We used LIDAR (Light Detection and Ranging) to produce a 3D model of the Roman theatre. This quantitative datasets allows us to demonstrate a significant tilt of the theatre's seating rows toward the basin margin fault, attesting to historic fault activity. We further present the first results of a Georadar (GPR) profiling campaign that aimed at the recognition of active faults in present-day lowland areas. The preliminary data show that many of the NW-SE trending faults cut the uppermost Holocene deposits and transect the overall N-S trending basin.

The integration and combination of various geological and geophysical techniques allowed us to obtain important information on the timing and magnitude of faulting in the Eşen Basin. Furthermore, our data importantly helps to acknowledge the, until now underestimated, seismic risk in the area