



Investigation of distributed vertical deformation along the western portion of the North Anatolian Fault Zone

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Quantifying the vertical slip rate of the active faults have importance to understand the morphotectonic evolution of a region under control of external and internal forces of the nature, and have implications for determining earthquake hazard.

We studied the terrace staircases formed along the Sakarya River, NW Turkey by means of mapping, cm scale measurement surveys and systematic luminescence/ radiocarbon dating. Four distinct terrace systematic along the river are identified, each with at least four steps, all formed during the Late Pleistocene. The terraces are formed with joint work of major global climate shifts (glacial/interglacial cycles) and tectonic uplift. These terraces are separated by three synthetic active branches of the dextral North Anatolian Fault Zone (NAFZ).

Well-resolved chronology of the individual terrace steps indicate ~ 0.68 , 0.34 and 0.7 mm/year uplift rate, from north to the south respectively. These values reflect the rate of differential vertical deformation along the branches of the NAFZ and overall northwest Anatolian block.

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