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Late Cretaceous to Recent Kinematic Evolution of Turkey

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Late Cretaceous to Neogene evolution of Turkey is dominated by the subduction of the Neotethyan oceanic crust and events related to the collision of various continental fragments with Eurasian and Gondwana affinity. Our newly acquired stratigraphical, structural, kinematic and geochronological-geochemical data collected mainly from Pontides, Taurides (mainly central Anatolia), E and SE Anatolia point out that Turkey is divided into two kinematic domains during the Late Cretaceous to Miocene. These kinematic events are connected but mutually exclusive. The main boundary lines between the kinematic domains are the 1) Samsun-Imranlý Zone which separates Eastern Pontides from the rest of the Pontides and 2) the Erzincan-Kayseri-Ecemis Zone which approximately corresponds to Sivas Basin (s.l.) To the west of these zones, Late Cretaceous to-Early Miocene is characterized mainly by compressional events related to the collision of the Taurides with the western and central Pontides. To the east of these zones, extensional and compressional events were alternated until the final collision of the Arabian plate that gave way to beginning of Neotectonic Period in Turkey. In the west,four deformation phases are recognized. The first and the oldest deformation phase is related to subduction processes in the Late Cretaceous to earliest Paleocene. The second deformation phase took place during the Late Paleocene to Earliest Miocene and related to the compressional events in the north while extensional events took place in the south (on the Tauride-Anatolides) and SE. The third deformation phase is characterized by extensional deformation and took place during the Burdigalian to pre-Tortonian period. The latest deformation phase is characterized by transcurrent tectonics and related to Neotectonic events. In the east, however, five

deformation phases are recognized. The oldest deformation phase is characterized by extensional deformation related to subduction and basin formation processes during the Late Cretaceous to Middle Eocene. The extensional phase is followed by the compression (phase-2) and took place in the Late Eocene to Oligocene. During this phase Bitlis-Poturge Block collided with the Goksun-Baskil Arc which in turn collided with the Taurides. This gave way to south vergent thrusts in the south of the arc while north vergent thrusting in the north which collectively stacked and transported more than 200 km over the Sivas Basin. Thrusting is coupled with basal salt layers deposited within the Sivas Basin (s.l.) Late Oligocene to Middle Miocene is characterized by extensional deformation during which shallow marine carbonates was deposited in the southern and eastern Turkey. The extension during this period is thought to result from slab roll-back processes which also coincides with the beginning of collision in the NW tip of the Arabian Plate that gave rise to wide spread flysch deposition in the Arabian fore-deep. By the end of the Middle Miocene, the slab start to detach from east to west and gave way to sudden uplift which subsequently resulted in widespread continental deposition in closed basins. By the beginning of the Tortonian, whole eastern Anatolia start to uplift which is coupled with widespread collision type volcanism and subsequently gave way to transcurrent tectonics in Turkey.