

## عنوان مقاله:

TECTONIC IMPLICATIONS OF GPS MEASUREMENTS OF CRUSTAL MOTIONS AND DEFORMATIONS IN THE EASTERN MEDITERRANEAN AND CAUCASUS

## محل انتشار:

چهارمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1382)

تعداد صفحات اصل مقاله: 13

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## خلاصه مقاله:

GPS observations for the period 1988 – 2002 in the eastern Mediterranean/Caucasus region allow us to quantify the active tectonics of this region where the African-Arabian-Eurasian plates interact. We present improved estimates of present-day Euler vectors based on the GPS results that define well the relative motions of these plates. The GPS-derived Euler vectors differ significantly from NUVEL 3 Ma averages. In contrast, the Arabia-Africa GPS Euler vector is indistinguishable at the 95% confidence level from the updated 3 Ma result based on detailed re-examination of magnetic anomalies in the Red Sea. On this basis, we suggest that Arabia plate motion has not changed at the 1 mm/yr level over the past 3 Ma. We present a simple kinematic model consisting of the three major plates (Africa, Arabia, Eurasia) and three smaller plates or blocks in the plate collision zone (Anatolia, Aegea, E. Turkey/Caucasus) that accounts for much of the GPS-observed motion. Using this simple model, we present upper bounds on fault slip rates for major, block/plate bounding faults. Using a dense GPS network including continuous stations and survey monuments, we determine pre-, co-, and early post-seismic motions for the 1999, M=7.5 Izmit, Turkey earthquake sequence. The earthquake deformation data are consistent with a model including aseismic fault slip at depth (pre-seismic) loading the seismogenic fault (i.e., above about 20 km), catastrophic failure within the seismogenic zone (coseismic) initiating on a velocity strengthening patch of the fault (i.e., a region of reduced dynamic rupture), and accelerated aseismic fault slip following the earthquake concentrated below fault patches with high coseismic slip and on shallower patches that experienced reduced coseismic slip. We discuss the implications of this model for earthquake prediction and hazard estimation.

## کلمات کلیدی:

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/2040>



