

ACTIVE DEFORMATION OF MAKRAN (SOUTHEASTERN IRAN) USING CONTINUOUS GPS MEASUREMENTS

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This research uses data from GPS permanent stations located in southeastern Iran to investigate active deformation across the Makran subduction zone. In this regard, the GPS data from 12 stations within southeastern Iran are processed using GAMIT/GLOBK software (Herring et al., 2009 a&b) and their spatial coordinates and velocity vectors are estimated for the period 2009-2011. Based on preliminary motion estimates we suggest that from the total rate of convergence between the Arabian and Iranian plates (i.e. 23-26 mm/yr, see Vernant et al., 2004) about 12-19 mm/yr shortening occurs in the Gulf of Oman, along the subduction zone as well as across reverse faults of the submerged section of the accretionary prism. The subduction rate increase from west to east Makran and a clockwise rotation is also observed in the velocity vectors consistent with the location of Arabia-Eurasia Euler vector of 27.9° N, 19.5° E, 041° M/yr. Stations on shore however, show that the shortening rate across the forearc region is about 6 mm/yr. The results of motion estimates indicate that, in the Makran back arc region, extension occurs at a rate of about 9 mm/yr. Also, a difference in the direction of velocity vectors in different stations on both sides of the volcanic arc implies a left lateral strike-slip component that is consistent with the oblique motion of Arabia with respect to the central Iran block. Differences in the direction of the velocity vectors of FHRJ and ZABL stations show a component of dextral strike-slip with a rate of about 13 mm/yr in the east of the Lut block. However, the velocity vectors of the GPS stations in the western area of the Lut block indicate a negligible dextral strike-slip component in this region.

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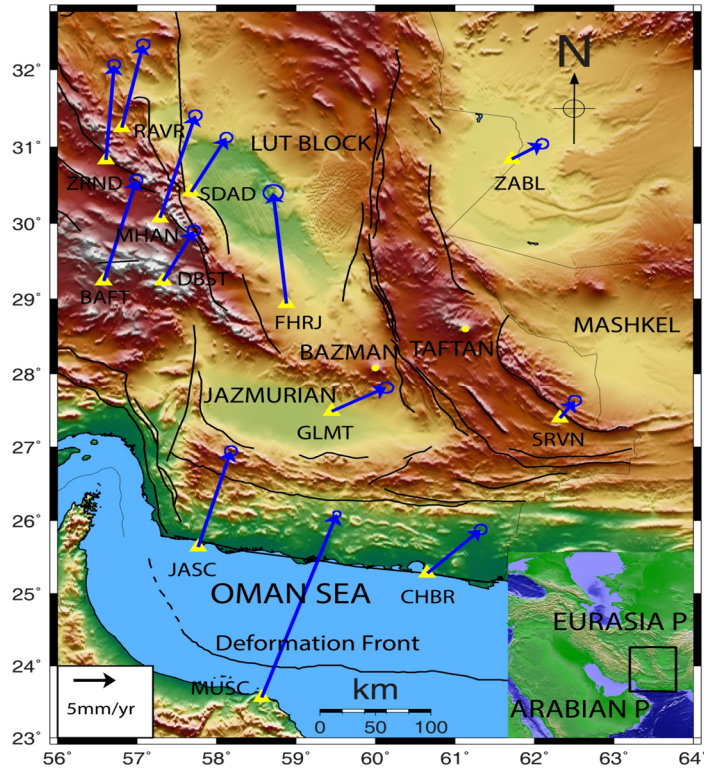


Figure 1. GPS horizontal velocities and their 95 per cent confidence ellipses in an Eurasia-fixed reference frame for the period 2009-2011.