We present a new GPS velocity field for Arabia and surrounding areas based on observations from 1994 to 2012 (Figure 1). The improved resolution of GPS observations is beginning to provide constraints on strain internal and Arabia plate deformation is small and marginally significant in comparison to the rate of Arabia-Eurasia convergence (Figure 2). The overall trend is consistent with slowing of AR-NU relative motion (see GPS and plate tectonic Euler vectors, Figure 5). The spatial distribution of strain cannot be resolved from the sparse available data, but compressional strain is apparent in the eastern part of the plate. Apparent compression extends > 200 km west of the Zagros Fold while the east and south sides of the plate are dominated by active continental collision (Zagros, Turkey/Caucasus) while the west and south sides are bordered by mid-ocean ridge spreading (Red Sea and Gulf of Aden).

Contemporary GPS versus geologic plate motions

Figure 4 GPS velocities and 95% confidence ellipses for the Arabian Plate with respect to the plate tectonic Euler vector for Arabia based on magnetic anomalies in the Red Sea (Chu and Gordon, 1998). All sites have small westward motions (note scale) indicating slower GPS than plate tectonic (3 Ma) plate motion. Stations in the eastern and central part of the plate show significant westward motion suggesting ~E-W compressional strain not resolvable in the broad scale strain rate estimates (Figure 3).

Summary

We present a new GPS velocity field for Arabia and surrounding areas based on observations from 1994 to 2012 (Figure 1). The overall trend is consistent with slowing of AR-NU relative motion (see GPS and plate tectonic Euler vectors, Figure 5). The spatial distribution of strain cannot be resolved from the sparse available data, but compressional strain is apparent in the eastern part of the plate. Apparent compression extends > 200 km west of the Zagros Fold while the east and south sides of the plate are dominated by active continental collision (Zagros, Turkey/Caucasus) while the west and south sides are bordered by mid-ocean ridge spreading (Red Sea and Gulf of Aden).