**ABSTRACT**

The Kopeh-Dagh and Balkan mountain ranges of West Turkmenistan are actively deforming as a result of Arabia-Eurasia collision. Reconstructed displaced geology relative to 55°E and right-lateral strike-slip fault segments comprise the Kara Kala fault zone. Reconstructed displaced geology relative to 55°E and right-lateral strike-slip fault segments comprise the Kopeh-Dagh fault zone, west of 55°E. Fault plane solutions indicate kinematics of the region, and the onset of South Caspian subduction are expressed as a series of right-stepping anticlines (affecting Pliocene Red Series and younger sediment s), forming important traps for hydrocarbons. The uncalibrated age of north-vergent thrusting west of 55°E and south-vergent thrusting east of 55°E has resulted in the imbricate fault zone being ~20-40 km. Resulting advection for South Caspian active compressional fault movement at rate and strike-slip component indicates a NW-SE shortening rate of 0.4-6 mm/yr and right-lateral strike-slip rate of 5.7-5.9 mm/yr across the Balkan region. The Kopeh-Dagh and Balkan-Ashkabad strike-slip zones may be related to fold growth. The rate of shortening across the Balkan thrust, ~40 km offset right-lateral Kum Dagh-Ashkabad fault zones. Thrust earthquakes are relatively deep (30-45 km) and parallel north-south "kinematic zone", which extends ~40 km north beneath the south-vergent Balkan anticline. Recent uplift is also indicated by extensional faults which displace Quaternary deposits - thrusting north beneath the south-vergent Balkan anticline. This work investigates exactly how this motion is accommodated by active faults at the Earth’s surface, as well as the implications the Balkan-Ashkabad regions pose to the regional tectonic evolution.

**INTRODUCTION**

The satellite image of the left-lateral Karak Kala fault system

**DISCUSSION**

1. The NW-NW motion of the South Caspian-Kopeh-Dagh block, relative to Eurasia, is accommodated by partitioned right-lateral slip faults in the Ashkabad and Balkan-Kum Dagh fault systems.

2. The change in polarity of thrusting (S-vergent within the Balkan region, N-vergent in the Ashkabad region) results in the ~40 km offset of the right-lateral strike-slip faulting and thrusting, west of 55°E and east of 55°E, respectively.

3. The Ashkabad fault system forms the northern margin of the Kopeh-Dagh, west of 55°E. NW shortening across the region is accommodated by right-lateral strike-slip and parallel thrust fault segments.

4. The Ashkabad fault system forms the northern margin of the Kopeh-Dagh, west of 55°E. NW shortening across the region is accommodated by right-lateral strike-slip and parallel thrust fault segments.

5. Thruhgt earthquakes occur near Kara Kala anticline, ~61 Ma, which is present-day kinematics of the region, and the onset of South Caspian subduction beneath Eurasia, may be older than previously thought (~55 Ma).

**CONCLUSIONS**

- The NW motion of the South Caspian-Kopeh-Dagh block, relative to Eurasia, is accommodated by partitioned right-lateral slip faults in the Ashkabad and Balkan-Kum Dagh fault systems.

- The change in polarity of thrusting (S-vergent within the Balkan region, N-vergent in the Ashkabad region) results in the ~40 km offset of the right-lateral strike-slip faulting and thrusting, west of 55°E and east of 55°E, respectively.

- Extensional features across the Balkan anticline may be related to fault growth.

- Recent uplift is also indicated by extensional faults which displace Quaternary deposits - thrusting north beneath the south-vergent Balkan anticline.

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