THE FRACTURE PATTERN IN SOUTHERN ISRAEL AND SINAI PENINSULA IN SEDIMENTARY AND BASEMENT AREAS

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ABSTRACT

The Sinai Peninsula and Southern Israel are bordered by taphrogenic features: Dead Sea rift system in the east and the Gulf of Suez graben in the west. The peninsula is divided into two tectonic units: igneous-metamorphic basement in the south and the sedimentary cover occupying the northern two-thirds of the peninsula.

The flat sedimentary area is disturbed by a wide E-W belt of en echelon folds and dextral strike slip faults. The joints, faults and photolineations within this belt were studied by field measurements and photogeological mapping. Three dominant patterns characterize the fractures:

Pattern 1. The Mesozoic folded formations are jointed and faulted predominantly by a NW-SE-trending set.

Pattern 2. The flat locally slightly folded Eocene units are fractured by various sets. No regional dominant set could be distinguished.

Pattern 3. E-W strike slip faults are associated with a broad shear zone through both the folded and flat regimes. This shear zone continues westward into Egypt.

We show that the NW-SE fractures (Pattern 1) are secondary fractures to the 100-200 km wide right lateral shear zone (Pattern 3). However, the photographic comparison of the three patterns indicates that the secondary fault sets can dominate and mask the regional major faults in quantitative analysis.

The pattern of basement lineations in the Sinai ERTS-1 images consists of three sets which approximately coincide with the trend of three major tectonic features: Gulf of Eilat, Gulf of Suez and the E-W fault system.

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