

Structural evolution of southern Kohat Fold & Thrust belt, Karak area, Pakistan

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Abstract

Structural evolution of Southern Kohat Fold and Thrust Belt is interpreted through a structural model and two geo-seismic balanced cross sections prepared by integrating dip domain data, seismic data of 96-SHD-313 and well bore data of Makori East 1. The model and sections reveal the subsurface geometries of folds and thrusts and variation of structural style along trend in relation to fold and thrust kinematics. Samana Suk Formation of Jurassic age is taken in subsurface seismic data for which time to depth conversion is done and the values are extrapolated to cross sections. The geo seismic balanced cross section shows that the thrust faults emanating from basal detachment located at sedimentary crystalline interface become steeper up section as indicated by bedding attitude at surface along thrust traces. The tight anticlinal and broad synclinal folded structures evolved on Eocene evaporites as detachment folds were truncated by thrust faults along their limbs at surface which relates that folds formed earlier than faults. The structural models show that variation of surface structures along the trend is proved to be the result of variable displacement of thrusts along their strike. The restored sections show approximately 7-8 Km of shortening accommodated by deformational structures. This research suggested that the Southern Kohat Fold and Thrust belt is structurally evolved in two distinct stages of deformation along the multiple detachment horizons. In the first phase detachment folding along Eocene evaporites had accommodated the shortening which is superimposed by thrusting emanating from basal detachment.