

Research Article

## Determining the age of the folding process of folded structures based on restored cross-sections, Zagros folded and thrust belt, central Lurestan region, southwest Iran

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**Key words:** *Central Lurestan, Zagros Simple Folded Belt, Structural geological cross-section, Deformation pattern, Shortening.*

### 1-Introduction

The study area of this research (Lurestan) is located in the southwest of Iran and the northwest of the Zagros thrust belt. This area is rich in hydrocarbon reservoirs. The tectonic deformation of this area indicates the presence of a thin-bedded and thick-bedded structure. The folding wavelength of the Lurestan has a short period because of the low thickness of the sedimentary sequence (Colman-Sadd, 1978; Blanc et al., 2003; Sepehr et al., 2006; Sherkati and Letouzey, 2004) indicates the presence of deformation and shortening in both the sedimentary and bedrock parts. Thus, It is essential to investigate the history of deformation and determine the pattern of the main geological structures.

### 2-Material and methods

This research investigates the history and deformation pattern by combining structural data, seismic profiles, cross-sections, and available information from wells. Using these data along with stratigraphic information, geometrical folding, and corrosion modeling was done by the kink method (Suppe, 1985). The perpendicular cross sections were drawn along the geological structures of the Sultan, Sarkan, Eastern Darrehbانه, Chaharqaleh, and Kuhdasht anticlines. The formation units (Precambrian to Miocene) have been reconstructed using de-compaction and unfolding processes. At each stage of the restoration, the rock units of the formations have been returned to a de-compacted and unfolded unit.

### 3-Results and discussions

The cross sections drawn in this research show that the difference in the folding of the layers in different parts is caused by the change in the folding style in the lateral and depth direction in the region. Based on the results, the age of folding in Sefidasht, Zangul, Poshte-Jangal, Amiran, Sarkan, and Sultan anticlines are Paleocene. Still, this age in the Kabirkuh anticline is due to the change in the Oligocene-Miocene facies, and the types of folds are separated.

### 4-Conclusion

The total shortening along the cross sections is 25.6% to 27%. The different mechanical behavior of the sedimentary sequences in the folding process is the controlling factor of folding style and geometry. Therefore, the activity and function of the lower Paleozoic deposits as the lower detachment surface, the Jurassic and Lower Cretaceous sediments as the middle detachment surface, and the Paleocene flysch sediments as the upper detachment surface have caused changes in the folding geometry.

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