

# Fault tectonics of the Ukrainian Carpathian foredeep and its basement

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The development of the fault tectonics of the Ukrainian Carpathian Foredeep (UKF) and its basement from the passive continental margin to neotectonic stage is discussed. The investigations are based on the geophysical data, well sections, subcrop maps, the maps of thickness of Jurassic, Cretaceous and Miocene deposits. By the study of paleo-stresses that caused the fault formation we have used their kinematic characteristics. It was created the charts of  $\Delta d$  across several profiles to determine the synsedimentary character of fault development. Neotectonic investigations of the UCF were carried out for the study of the influence of active fault structures on relief forming processes. Among them are the creation of relief maps, the maps of neotectonic elevation measuring the strike of linear stream system on topographic maps.

The results of the investigations mentioned above are: On the stage of passive continental margin the faults of the UCF developed as synsedimentary central faults. This is suggested by the thickness changes of the contemporaneous deposits in hanging and footwalls of the faults. The changes of the thickness of Jurassic and Cretaceous deposits along strike of the Ukrainian Carpathian Foredeep indicate the

existence of three segments within basement: NW, central and SE ones. These segments different had geological history. On the stage of the transition from passive continental margin to the foredeep some of the faults of the UCF acted post-tectonic. These peculiarities of the fault development were distinguished by the analysis of  $\Delta d$  charts.

The forming of the Miocene faults is connected with the development of the UCF. Some of the faults are inherited from previous stages. The Miocene faults are characterized as synsedimentary ones. Their amplitudes increase toward the Carpathians. The main forces that caused the fault formation are shown on the base of the plane dips and strikes of the faults and movement directions along them.

The main plane of the extension dips to the west under 70–80°. These faults are probably connected with development of the retreating subduction zone in studied area. The reflection of thrust nappes and strike-slip faults in relief is typical for the neotectonic stage. This is visible on  $\Delta H$  maps, neotectonic amplitude map and on the map of the strike of linear stream systems. The activity of faults (thrusts) decreases toward the foredeep. The most active was the NW segment of the UCF. The UCF consists of two parts: outer-autochthonous and inner—allochthonous ones which have different fault history. In the outer zone faults are inherited from the basement while thrusts and strike-slip faults are newly formed.