Seismic image of the top of Jurassic structure under Polish Outer Carpathians in the zone Southeast of Krakow

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The modeling is a method well supporting seismic research during projecting, processing and interpretation of seismic data. In the presented paper, the multivariate seismic modelling was used for evaluation of influence of changing structure of Carpathian flysch on the seismic image of Upper Jurassic (Malm) rocks. This research investigated Podgrodzie structure in the marginal part of the Outer Carpathian fold-and-thrust-belt. The gas deposits in this area are localized on tectonic uplifts, bounded by thrust dislocations.The complex structure and tectonics of the Carpathian flysch makes the interpretation of seismic image of the reservoir Upper Jurassic carbonates somewhat difficult. The poor recognition of velocities of flysch sequences makes this interpretation even more difficult. The multivariate seismic modelling is necessary in this situation. It allows evaluation of influence of selected model elements of the originating wavefield. It is possible finding the model correctly approximating investigated orogen by matching registered and theoretical field. The Outrider (*Divestco Inc*.) and Omega (*WesternGeco)* system were used for offset and zero-offset modelings. The performed modelling shows that influence of changing velocity and geometry of reflecting boundaries on underlying stratigraphic stages is insignificant. This influence is only significant in the zones of steep dipping flysch layers where large horizontal contrast of velocity significantly influences the seismic image of Jurassic rocks. Outside these zones the seismic image of the top of Jurassic reliably restores the real boundary. The obtained results show that the multivariate seismic modeling is a method, which can be used with good results, under the complex seismogeological conditions. The modelling could be also helpful evaluating the reliability of register seismic data.

On the link between the formation of the Pannonian basin and the extensional collapse of the Dinarides

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Classical models of evolution in the Alps-Carpathians-Dinaridic domain assume that the formation of the Pannonian back-arc basin is related to the rapid roll-back of European slab and the invasion of the Tisza-Dacia and Alcapa upper plate blocks into the so-called Carpathians embayment starting at ~20Ma. The general mechanism assumes a gradual evolution, an initial mechanical phase of extensional detachments being recognized near the transition between the Alps and the Pannonian basin, which was subsequently followed by upper crustal normal faulting and a thermal phase during the Middle-late Miocene, observed in the central part of the Pannonian basin. Hence, an always standing contradiction existed between the limited amounts of extension recorded in the crust and the large scale astenospheric upraise which took place beneath the basin centre. This apparent contradiction can be mechanically resolved by the existence of large scale extensional structures in other areas neighboring the Pannonian basin, such as the Dinarides. These structures can be large scale extensional detachments, unroofing the footwalls over the orogenic structures of the Dinarides and collapsing the hanging-walls in the area of the Pannonian basin. Our study demonstrates the existence of three such major extensional detachments in the central Serbian