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THE CONTRIBUTION OF THE SEISMIC TO THE STUDY OF THE TECTONIC STYLE OF THE SELENICA–AMANTIA REGION, ALBANIA

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ABSTRACT

The study area is located in the sourthen part of Albania. The paper presents the geological - geophysical interpretation of the Selenica - Amantia area.

It represents the central part of the Jonian Unit, from the tectonic point of view. This area is characterised by an intensive tectonic activity and by presence of some source rocks in Mesosoic carbonate section. It represents one of the most perspective zone and exploration opportunities.

In the paper is treated meanly seismic velosity model as a very important tool for interpretation of geological framework of the area. During the work we had present many geological data as deep wells, surface geology, seismic and gravimetry data.

Reprocessing of the seismic lines with updata programs helped us to improve interpretation and identifiding the most important prospects.

KEY WORDS: Ionian zone, Albania, Selenica–Amantia, Bolena–Amantia, Kocul, Amonica ECT.

1. INTRODUCTION

Authors of this paper would like to present a new tectonic model of the area. It is important not only to evidence new prospects on the area, but to identify some anticline lines, which countine on the south toward Greece. For this purpose are used conclusions of velosity gradient modeling based on horisontal and vertical gradients. In the study area are drilled a lot of exploration wells, where are performed seismologs, which helped very much for velosity modeling.

2. TECTONIC STYLE AND SEISMIC DATA INTERPRETATION

The selenica - Amantia area takes part in Kurveleshi anticline chain of the Jonian Unit.Figure 1

It is between Ballsh - Kremenara anticline chain to the East and Cika belt to the west. Figure 2.

The seismic lines are of 1980-1990 years and with "2D" registration. Based on their interpretation three strong reflection levels are distinguished going from the west to the east:

The first one is registrated in the western part (0.5-1.0) sec. and is very clear corelated with the outcroped limestone.

The second reflection is registered in 0.4-1.5 sec and belogs to Selenica-Kocul-Amantia anticline carbonate structures.

The third reflection (0,5-1.4) sec is corelated through a tectonic foult with the Kremenara structure outcroped to the eastern part.

Corelation of these reflections to the north-south direction it was possible to draw the western and eastern foults of the Selenica-Amantia anticlinal chain.

Because of the big overthrusting of the eastern structures and dippening of the eroded surface from the north to the south the velocity gradient changes to the all directions.

There are evidenced some characteristics of the tectonic style, which are common for the Jonian Unit. The study area represents a linear anticline chain, with highest part on the top of Selenica anticline.

The top of carbonate structures is eroded and jounger deposits overly transgressively, as they Messinian-Pliocene in Selenica and Burdigalian in Amonica.

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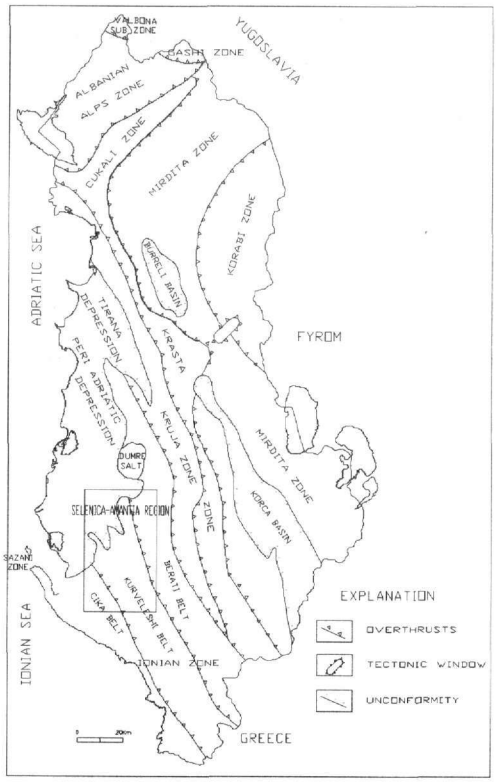

Fig 1 Study area location

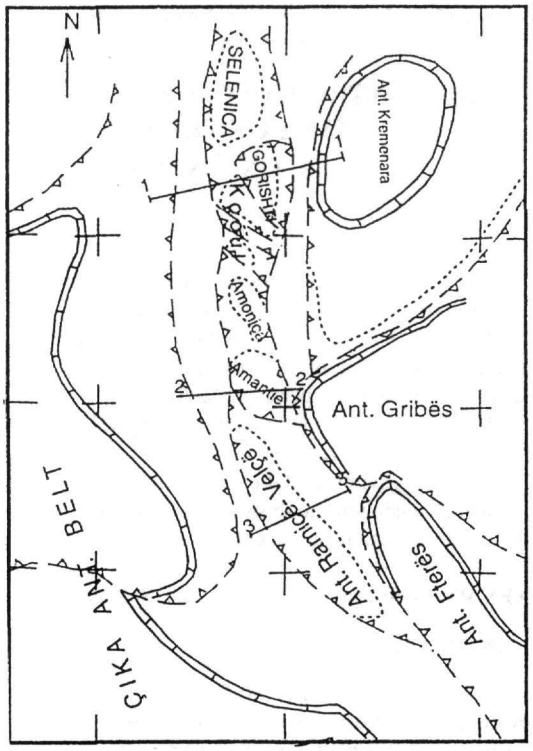

Fig. 2 Typical overthrust modelin Jonian Zone

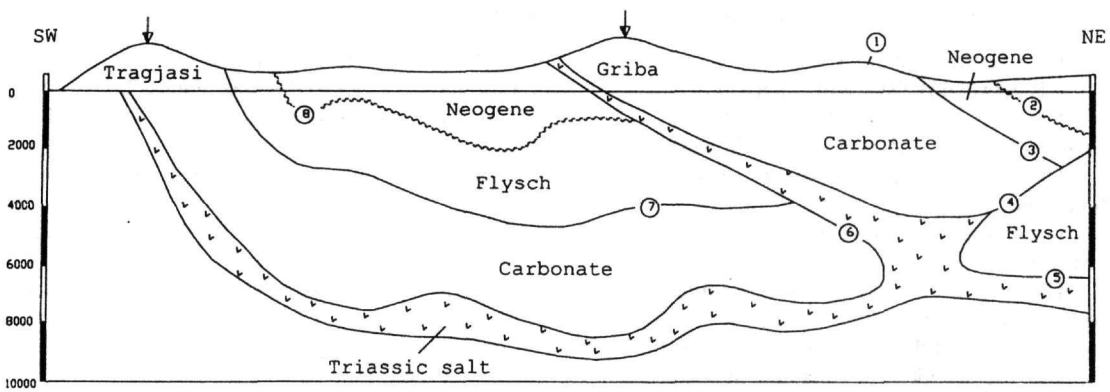

Fig. 3 The supposed geological overthrusting model previous the seismic works

Geological and seismic data show existing a fault system, in conformity with surface geology. Carrying of the seismic works in the area, were based on a simple geological model.Figure3. Gravimetry data indicate a positive anomaly extended Southwest - Northeast direction. Well and seismic data interpretation evidences some cross tectonic faults, having place since the oldest geological periods. Seismic lines have strong reflections on the top of carbonates, which contributes considerably on evidence of anticlines, faults, sinclines and eroded surfaces. Figure.4

In the very complicated geological situation and overthrusts, an important role have had define of the velocity gradient. It changes not only verticaly, but and horizontaly.

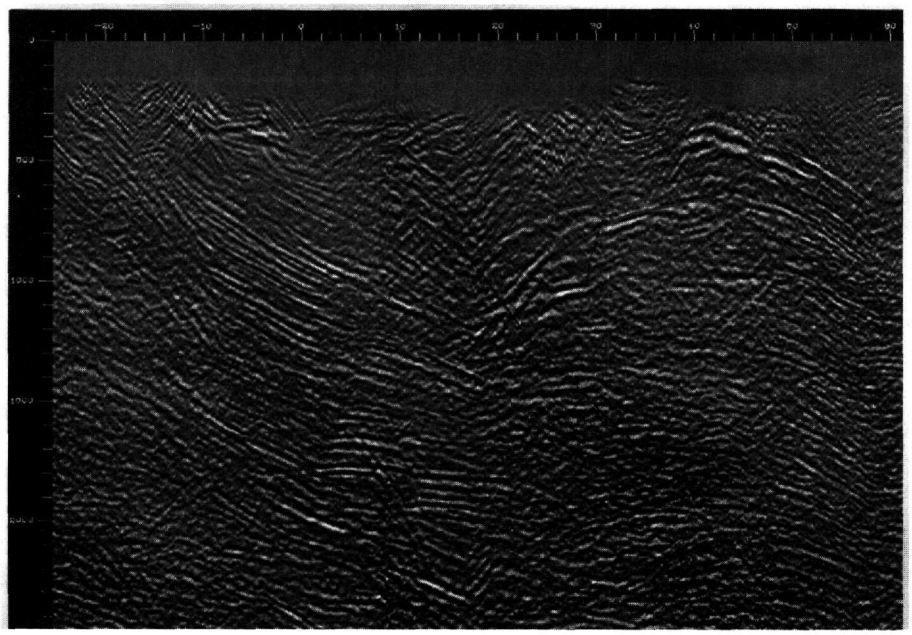

Fig. 4 The seismic model helped for the construction of a better geological model

There are defined Mollase deposits velocity, flysch velocity and Carbonate one. On the overthrust zones, it was very important to keep present velocity of the overthrust Carbonate section. So, geological framework of the area is more complicated then was presented in the previous studies.

The main characteristic of the tectonic style is overthrust of the carbonate structures toward west and some backthrusts formed in their Eastern flank. This phenomenon is encountered in Kocul, and Amonica zone, because of overthrust of Kremenara anticline toward west.

Toward South influence of eastern carbonate anticlines is decreasing and for that reason underlined anticline are reflected clearly. Therefore, it was easer for seismic reflection correlation and integration of the other factic data. Step by step it was made possible to "draw" a tectonic and structural configuration in the depth, which is more acceptable according to the plate tectonic theory. On this result helped and existing oil fields which configuration served as a "real" model of the anticline structures. Structural model represented on the base of the seismic interpretation and velocity gradients helps us for prognosis of new carbonate anticlines.

3. CONCLUSIONS

Western thrusting and backthrust features Eastward are characteristics already known for the structures of this region, which make the geological model more complex.

The Eocene unconformity on the top structure shows the earliest phase of the compression regime in the Ionian zone.

The recognition of the exact value of the lateral change gradient of the seismic velocity, gives a good contribution for the interpretation of geological setting under tectonic over thrusting and within normal carbonate section.

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