

# Reply to «Answer of S.M. Stovba to comments of Ye. Korniyenko-Sheremet ..., 2021»

*Ye. Korniyenko-Sheremet, 2021*

University Côte d'Azur, Sophia Antipolis, France

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Dear Mr. Stovba, thank you for your answer to my comments.

I must admit, the Fig. 2, *b* which you presented in [Stovba, 2021] based ostensibly on results of [Sheremet et al., 2016] shocked me at first sight, because the results were not what we'd expected if we had to interpret this part of the seismic profile (in the deep part of the Black Sea). Thus, we looked at it more attentively and compared the two figures (Fig. 1 and Fig. 2, *b*) from [Stovba, 2021]; and then we realized that you just skillfully changed the interpretation on Fig. 2, *b* (!): on the Fig. 2, *b* you slightly modified the limits of «our» seismic units apparently to confuse an inexperienced reader.

I kindly ask you not to do this anymore. You

have the right to criticize our works as much as you like, you have the right to ignore them, you have the right to defend your own point of view with arguments, but you have no right to falsify the research results.

So, let's take a look at your interpretation, which you proposed as possible after [Sheremet et al., 2016]:

I present here the Fig. 1, 2, 3 from your «Answers ...» [Stovba, 2021].

Your Fig. 1 claims a prolongation of the limits of «our» interpreted seismic units into the deepest part of the Eastern BS. If only here you are honest, the proposed right part of the profile is its «real» prolongation. However, what is presented as «right» part on the Fig. 1 still

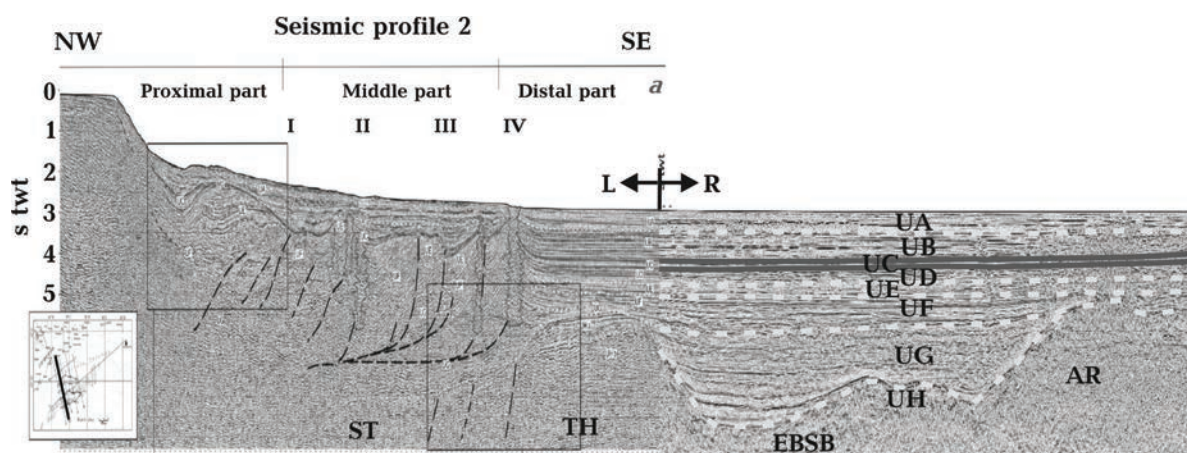


Fig. 1. Left part (L) shows the interpreted seismic section of [Sheremet et al., 2016] in their Fig. 4 and the right part (R) is the continuation of the same profile showing prolongation of seismic horizons of [Sheremet et al., 2016] for the Paleocene-Quaternary sedimentary cover. The diapiric structures and mud volcanoes according to [Sheremet et al., 2016] are represented by zigzag red lines. Main abbreviations for the sedimentary units are according to Fig. 9 from [Sheremet et al., 2016]: UA — Quaternary; UB — Pliocene; UC — Late Miocene; UD — Middle Miocene; UE — Oligocene—Early Miocene; UF — Eocene; UG — Paleocene; UH — Cretaceous. Abbreviations of tectonic units: AR — Andrusov Ridge; EBSB — Eastern Black Sea Basin; ST — Sorokin Trough; TH — Tetyaev High (Shatskiy High). Other explanations can be found in [Sheremet et al., 2016].

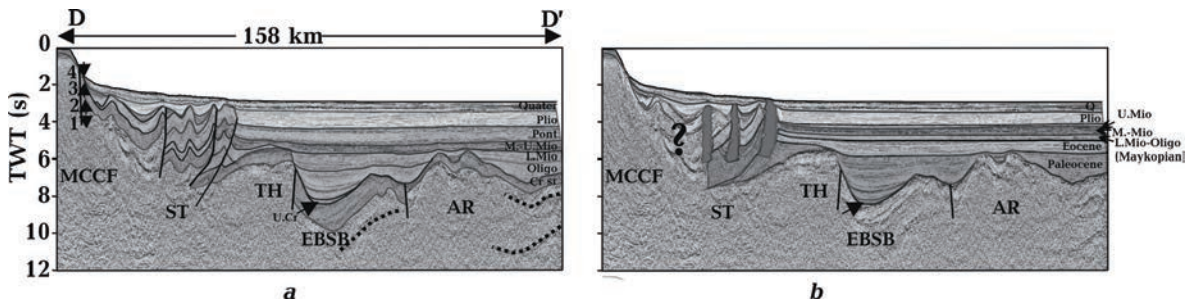


Fig. 2. The seismic section of [Stovba et al., 2020] in their Fig. 6, *a* and the same seismic section as in (*a*) with the approximation of the interpretation by [Sheremet et al., 2016] for the Paleocene—Quaternary sedimentary cover (*b*). The question mark in the northern part of the section shown in (*b*) means that any seismic horizons can be found to transfer the interpretation from the seismic section demonstrated in the left part of Fig. 1. Quarter—Quaternary; Plio—Pliocene; Pont—Middle and Upper Pontian; M.-U. Mio—Middle and Upper Miocene; L. Mio—Lower Miocene (upper part of Maykopian sediments); Oligo—Oligocene (lower part of Maykopian sediments); U. Cr — post-rift Upper Cretaceous; Cr sr — Lower and Upper Cretaceous syn-rift sediments. Abbreviations of tectonic units: MCCF — the Marine Continuation of the Crimean Folds; other abbreviations are the same as in the Fig. 1. Additional explanations for (*a*) can be found in [Stovba et al., 2020].

stays only «yours» interpretation based only presumably on interpretation visible at the «left» part of the Fig. 1. Additionally, the quality of the «right» part of the Fig. 1 is very bad, but even with this very low resolution seismic profile we would outline the base of units UF (Eocene) and unit UE (Oligocene—Early Miocene) a bit lower, than you did.

We don't want to discuss the motives of what you did next, but on Fig. 2, *b* you changed the base of Eocene (UF) — you drew it much higher here in comparison with line-drawing on the Fig. 1: the base of the Eocene on your new Fig. 2, *b* does not touch the top of the Andrusov Ridge, but it touches it on Fig. 1. Consequently, all the seismic units since Eocene

(UF) (on proposed interpretation Fig. 2, *b*) appear shifted into the upper part of the seismic profile. Therefore, the proposed Fig. 2, *b* does not correspond to the results presented by [Sheremet et al., 2016 et al.].

Consequently, your comments for Fig. 2, *b* «The question mark in the northern part of the section shown in (*b*) means that any seismic horizons can be found to transfer the interpretation from the seismic section demonstrated in the left part of Fig. 1» sounds ridiculous, because in [Sheremet et al., 2016], we present a geological transect combining the results of seismic profile interpretation (off-shore) with geological cross-section based on filed observations in the Crimea Mountains (on-shore)

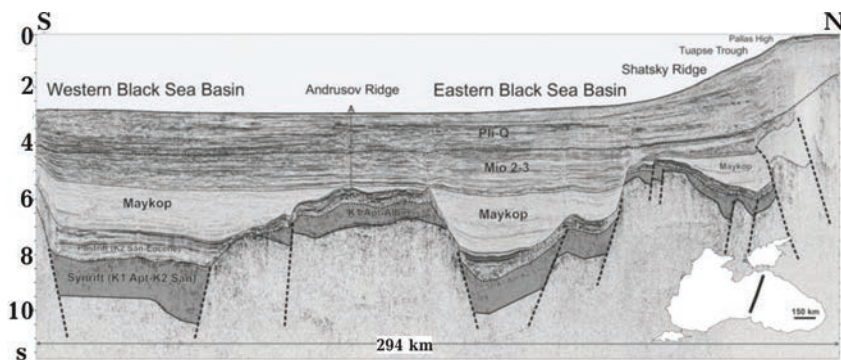


Fig. 3. The interpreted seismic section published by [Nikishin et al., 2015c, Fig. 21].

[Sheremet et al., 2016]. Thus, Fig. 2, *b* with it's question tag has nothing in common with results from [Sheremet et al., 2016].

In [Sheremet et al., 2016] as well as in Korniyenko-Sheremet [2020] we've already provided comments about interpretations of Nikishin et al. [2015a—c] and Stovba et al. [2013] concerning the timing of deformations in the Crimea off-shore, the Sorokin trough, which we mostly based on published materials about the Subbotina well [Stovba et al., 2009, Vakarchuk et al., 2016]. We couldn't date seismic facies in the deepest part of the Eastern BS in view of the absence of corresponding part of the seismic profile to connect it with the Sinop well. What you are arguing is this very southern end of «our» seismic profile (Fig. 1, «left» part), which was not the target of the paper [Sheremet et al., 2016].

We kindly remind you that it was [Stovba et al., 2009] where the seismic line containing the Subbotina well was published. Interpretation of [Sheremet et al., 2016] for the Crimean sector of the BS off-shore, deformations within the Sorokin Trough, fits well this your research work (we mean [Stovba et al., 2009]). Thus, if you insist that your model for the BS presented in [Stovba et al., 2020] is correct, this means that you contradict yourself; at least it doesn't match the sector of the Crimea off-shore.

The Sinop well, drilled in 2010, which you apparently use in [Stovba et al., 2020] to convince readers that you are right, and here I only express my own opinion, didn't help much to make further progress in the BS geology, if in several years the interpretation presented in [Nikishin et al., 2015a—c] mostly repeats the one of [Finetti, 1988].

However, the presentation of V. Aydemir & A. Demirer [2013] about this well, the synthesis of which I give below, seems has to be taken into account:

1. The expected Maykopian was only presented in the Sinop well by its upper part, Upper Maykopian (Lower Miocene in age), and not estimated more than 15 m thick (the depth of the well is 5531 m). ... and it is the thinnest unit in the Sinop well right above the Eocene.

2. The top of the Andrusov Ridge on the se-

ismic line corresponds to carbonate interval, interpreted as Late Cretaceous in age.

3. The unit which on laps this mentioned «Cretaceous» Unit, which is the surface of the Andrusov Ridge, most likely corresponds to Eocene.

There are some new results of drilling from the deepest part of the Western Black Sea announced in January 2022 by Türkiye Petrolleri Anonim Ortaklığı (TPAO\*) (the link on their updated version of presentation is in the reference list). For their presentation, they used a seismic line BS-40, Fig. 5. from [Nikishin et al., 2015a, b]. Their results from the well show the Lower Miocene (Upper Maykopian) facies located upper, than it was shown on the interpretation of [Nikishin et al., 2015a, b], mainly in «Nikishin's» Middle-Upper Miocene horizon, which is not Maykopian. Only that could cast doubts on your interpretation, which you compared as the same as the one, proposed by [Nikishin et al., 2015a, b].

So, the Lower part of Maykopian, the Oligocene, is most likely presented but in the deepest part of the Black Sea subbasins (the Eastern and the Western Black Sea). However, the thickness of the Oligocene is not yet clear for the Black Sea until the stratigraphic column from the Sakarya area will be well constrained.

To note, that except the Maykopian unit, there is an organic matter-rich Kuma Formation [Beniamovski et al., 2003; Sachsenhofer et al., 2018] which is of the Middle-Late Eocene age. So, what if the unit interpreted by [Nikishin et al., 2015a—c] as the Oligocene—Early Miocene in age in fact could be of the Eocene age? At least it fits well the presentation of V. Aydemir & A. Demirer [2013] about the Sinop well and, consequently, is close to results from [Sheremet et al., 2016].

We absolutely agree with your opinion that «the final solution to this issue is possible only after 3D seismic surveys and drilling in this part of the Ukrainian sector of the Black Sea» [Stovba, 2021]. However, there is another «unpopular» way: until we don't have all of those new results, one can try to imply the results made, as you noted, by people with a some experience on seismic interpretation. At least it wo-

uld make progress in research, cut off unlikely theories and might bring us closer to the truth.

Dear Mr. Stovba, at the end I just want to add that this is my last published answer to your attacks, criticism, accusations etc. I just

call you to sanity. Our research team (co-authors of [Sheremet et al., 2016]), I am persuaded, is open to any discussion concerning the Black Sea geology but in a more efficient format to clear up all the differences of opinion.

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