The authors here focus on the P wave velocity structure in a significant region of the north-east Tibetan Plateau and the southern segment of the Central Asian Orogenic Belt, using seismic wide-angle reflection and refraction profile. The data is precious here, and the velocity structure can be the key for us to understand the north-east expansion of the Tibet and the tectonic process of the Paleo-Asian oceanic.

The data process and uncertainty analysis for the inversion of velocity structure are detailed and reliable. However, the manuscripts have a large problem with writing. Many sentences are expressed vaguely and do not conform to grammar rules. The authors need to improve their English writing, so that they can make their interpretation clarity.

I'm inclined to suggest that this paper be published after the authors revise the English writing and all the questions as follows.

General Comments:

Q1: Please use consistent abbreviations and use the full spelling for the first occurrence of an abbreviation, e.g. CAOB, PAO. And make all the units be uniform, for example, the authors first use "km" and then use "kilometers".

Q2: I think the authors use ZPLOT to pick the arrivals and apply RAYINVR to get the velocity structure. However, they didn't mention the software in the text. I cannot rule out the possibility that they used other

methods. If so, please add them in the methods section.

Q3: What's the uncertainty when they picked the refraction and reflection arrivals?

Q4: Generally, the P wave velocity of upper crust is <6.4 km/s, middle crust is 6.4-6.8 km/s and lower crust is >6.8 km/s. The authors stated that they divided the upper crust from surface toP1, the middle crust from P2 to P3 and the lower crust from P3 to the Moho discontinuity (Line 169-172). What's the refer for their stratification? It's clear that the layer above the Moho is lower crust, which velocity is ~6.8km/s. If they make the P4 to the Moho as lower crust, their statements for the co-thickening of the middle-lower crust should be middle crustal thickening.

Q5: The velocity value is reliable in the region where have ray coverage. The authors should make it clarity for the resolved and unresolved velocity region. They stated that the Pn velocity in the upper mantle is ~ 7.7-8.6km/s. In my eyes, the Pn velocity is correct in the regions where have Pn's ray coverage, the max Pn velocity they can constrain is no more than 8.3km/s.

Q6: I do not think the authors have enough evidence for the conclusion that the upper crust is decoupled with the middle-lower crust (Line 371-373). If they got the conclusion based on previous studies, they should give robust analysis.

Q7: The authors stated that F5 is a regional large-scale strike-slip fault. This contribution is crucial significance for understanding the tectonic

mechanism between the CAOB and the Qinghai-Tibet Plateau. Can they give robust evidence to explain how this regional fault reconciles the huge displacement differences on both sides of the fault? Why are there no deep earthquakes along the local fault? This is very important for their conclusion.

Detailed Comments:

Line 19: “seismic wide angle and refraction profile spanning the……”,

Incorrect usage of professional terms, “seismic wide angle and refraction profile” must be “wide angle reflection and refraction profile”.

“Spanning the……” should be “spanning from the……”.

Line 20-21; 36-38; 58-59 etc. These sentences are ambiguous; a native English editing is required.

Line 39: “CAOB”

When an abbreviation is first used, its full form should be used.

Line 61-62: “Notably, … inhomogeneity non the …,”.

It is a mistake for “non”.

Line 83-84: “…… refraction profile sweeps throughout the North Qilian, Hexi corridor (containing the Jiuquan basin and the Huahai basin), and the entire Beishan block was done”.

Two predicates (sweep and was) are used in a single sentence.

Line 138-139: “To make the seismic records clearer, each trace was

bandpass filtered up to 8 Hz……”.

It is vague for the meaning of this sentence. The authors could write like “To improve the signal-to-noise ratio, we apply bandpass filter …... from … Hz to … Hz……”.

Line 177: “greater velocity zone”

Higher velocity zone

Line 186: “with an interface depth falling to 11.2–12.5 km.”

“Falling” is very strange here.

Line 188: “a high-velocity body”.

High-velocity zone or high velocity abnormality will be a better choice.

Line 200: “interface depth climbs to 17.6–27.5 km”.

“Climbs” is very strange here.

Line 201-203: “This characteristic shows that the North Qilian and the Jiuquan basin have a consistent basement, matching with the residual gravity anomaly findings (Yang et al. 2024).”.

According to the interpretation from the authors: there is a high velocity zone ~10 km below the North of Qilian, the velocities are totally different when compared to Qilian and Jiuquan basin. How did they get the conclusion that the North Qilian and the Jiuquan basin have a consistent basement?

Line 209: “the Jiuquan basin is 23.4–38.7 kilometers”.

It is necessary to keep consistency for the depth unit, e.g. using “km” in

the whole text.

Line 215: “The interval velocity increases to 6.3–6.42 km/s”.

Which part of the profiles show the velocity increases to 6.3-6.4 km/s?

Line 239-244: In this part, the authors try to state the difference features beneath the central part of the profiles. However, they should use more precise interpretation when using Pn velocity which is resolved by ray coverage. According to the ray coverage, the Pn velocity is not as high as they declared 8.4-8.6 km/s.

Line 293-295: “…… (0.01 - 0.1) …… (-0.01 - -0.12)”.

The authors missed the velocity units “km/s”.

Line 311: “while past geophysical ……”.

It is much better to write “while previous studies ……”.

Line 331-332: “…… the crust north of the Que’ershan subducted ……”.

Such a sentence structure is obviously incorrect.

Line 394 and 402: the authors forgot the numbers (1) and (3).

Line 409-411: the authors should complete the sentence, and make it correct.

Fig.1b and c: remove the faults which are not discussed in the manuscripts. It looks Indistinguishable and chaotic.

Fig. 2 and Fig. 3: To make the figures clarity, the authors should adjust these two figures to be the same size. And I suggest the authors add a white background to the letters (a) and (b).

Fig.5 and Fig.6: adding (a) and (b) on the correct profiles, marking the direction “SW” and “NE”, and giving the region of resolved and unresolved velocity according to the ray coverage.