The author presents the cross-borehole travel time tomography results for glaciological application. They propose sequential inversion which inverts both velocity structure and deviations of borehole trajectory. Especially, they propose to use two orthogonal polynomials to stabilize inversion instead of using individual source and receiver coordinates. They evaluate the method using synthetic and field data and conclude that their method could reduce artefacts due to the uncertainty of source and receiver positions. They also discuss the effect of anisotropy on their algorithm.

The ideas, methods, and data are unique and will contribute to scientific progress within the scope of Solid Earth. Their approach and applied methods are valid. The manuscript is well organized, clear, and interesting and I think it is good to be published with minor/moderate revision.

My comments/corrections are listed below:

- **Section 3**
  - It is better to show the day of data acquisition because its timing is discussed in Section 5. It would be easier for the reader to understand and evaluate the results in this manuscript.
- **Section 3, line 169**
  - It is not clear what the author trying to describe by “Geophones at the surface of the glacier complemented the measurement setup.”. It would be better to mention the purpose of geophone and their usage in this study (included in the inversion?).
- **Section 4, lines 252 - 254**
- It is difficult to understand which part of Fig. 7b is mentioned in this sentence. It would be better if the author describes the more detail of the figure and explain which part is polynomial coefficients one through 4th degree. Also, it is difficult to see which parts are a value > 0.99 since the color bar is monotone above the value > 0.2.

- Sections 4 and 5
  - Although the number of polynomials in the inversion is discussed in 6.2, the author does not show the value in their application to synthetic and field data. Its value is important for anisotropic effect according to 6.2. Please include the number of polynomials that are used for inversions in the manuscript.

- Section 5, line 304
  - This sentence explains that the author used two starting models for trajectory inversion. However, the result of interpolated trajectory case (second starting model) is already described in Fig. 8b in line 289. It is easier for a reader to understand if the prerequisite is described before or just after its results are shown.

- Section 5, line 305
  - According to the caption of Figure 8b, it is the result of using interpolated trajectories as an initial model. However, this sentence says that Figure 8b is the result using vertical boreholes as a starting model. It is inconsistent. The results of using vertical wells as an initial model are not shown in this manuscript. Please add the results.

- Section 6.1 line 338
  - “lower that” should be “lower than”.

- Figures 3, 4, 8 (a)
  - Legends in this figure are confusing since these are velocity inversion results without coordinates updated. The expression “updated coordinates” seems not right.

- Figures 3, 4, 5
  - It seems black asterisks and triangles in Figures 3 to 5 are coordinates for geophones. Please describe what “start coordinates” in the legends mean. The term “start coordinates” is also used in Figure 6, but it seems different from figures 3 to 5.