The paper investigates the shedding and mixing of air masses from the Asian summer monsoon anticyclone (ASMA) with the surrounding atmospheric background at the UTLS level, using a low PV values identification method to track ASMA air masses transport.

The manuscript is very well written, with a clear logic and the figures are easy to read and well-constructed. The methods are robust and the results are of relevance in the field. I therefore strongly encourage its publication provided some minor revisions:

General comments: The figures are very well presented but I would warmly suggest to add some animations as well as a supplementary material. It would be very instructive to be able to follow those cutoff phases along their transport (for example for the demonstrative case studies picked for the manuscript)

Also, the idea of the schematic (Figure 1) is valuable but I found it not self-explicative. One needs to read well the whole work to understand it properly. I would suggest the following:

-having smaller arrows and shorter, to connect each different cutoff phase (while now, for example for the direct transport, the black arrow encompasses 3 cutoffs images at once, and the yellow two and there is one 7.5 PVU cutoff that is left alone)

-Adding some increasing numbers/labels to the various phases or arrows. It will make easier to follow the description of the evolution of the cutoffs.

In addition, it's not clear at the beginning of the text, that this schematic is actually summarizing the results of the study since it's presented as a first thing and there is no mention of where it comes from!

Specific comments:

Line 67: "For that reason"? Do you mean "For those scopes?". Also I would rephrase the sentence between lines 68 and 69 to better emphasize that you use 3 specific PV threshold each one representing a distinct feature.

Lines 71-76: I think this section here is not necessary, and it's confusing to read before the approach is properly presented.

Line 95: It has to be explained in the text why you pick the 380 K level, there is no mention about this before this section.

Line 112: TST= Troposphere-Stratosphere Transport? No previous mention of this abbreviation before!

Line 151: "..are calculated forward on an isentrope.." The 380K one?

Line 158: By "arbitrarily" do you real mean totally random choice? Is it making more sense than choosing, for example, the largest by extension or the one with lowest PV values?

Line 122: I had some troubles understanding exactly how the tracks (the black, yellow, purple lines of Figure 2,3,10) are defined. A better description of the method would be beneficial and adding the following info: are those tracks representatives of which time period (when do they start, when are they stopped)? Are they starting from the geometrical center of the cutoff?

Figure 3 caption: "the largest cutoff (3.26% of NH).." is it referred to the area? I think it's better to specify it .

Line 238: Which is the mechanism that leads to higher frequency over Siberia, is that already known?

Figure 6: It's not clear which are the units of the upper row frequencies. The axis label gives no units (which I suppose means from 0 to 1) but then the panel 6b has values up to 2 (which suggest is in %).

Line 305: has this case been chosen for some specific reason? I mean, why not using the same case as before (Fig 3)?

Line 365: "..more frequent during the early stage than during the later stages" … of what?

Lines 392-393: I think this result should be emphasized more, for example in the conclusion section. That is an important information!

Lines 405: why the 6.5 PVU cutoffs have this noticeable drop in percentage with respect to the other cutoffs? Are there other processes related to those cutoffs or are those more difficult to correctly identify?

Lines 406: The fact that the filtering was tested only for year 2017 should be specified also at the beginning of the paragraph.

Technical comments:

Line 239: extenT instead of extenD

Lines 248: Shown in Fig. 6a,d

Lines 253: Shown in Fig. 6b,e

Figure 2-3-10 (but also the others): The position of the described cutoffs should be better emphasized, I would suggest making the labels of the cutoff size bold, or bigger, or underlined or put a marker at their initial position. It's otherwise hard to spot them.

Figure 4 caption: "A ~~frequency~~ of 1~~%~~ percent mean frequency.."

Figure 5: The dots symbolizing the starting and ending points of the track are not really well visible. Especially in the panel a, with green on green and in panel c with red on pink. I would suggest bigger dots and/or different colors

Figure 8: beware there are some typos in the legend of the cutoff PV values (panels a "cu1offs" and b "c10offs")

Line 390: Sibiria -> Siberia