Reply to Anonymous Referee #1 (Comments in *italic*):
We thank the reviewer for the helpful comments and suggestions. The comments by the reviewers are *in italics*, and our responses are in Times New Roman. Corresponding changes are highlighted in the revised manuscript.

Review of the second revised version of "Ionospheric Pc1 waves during a storm recovery phase observed by CSES" by X. Gou et al.
The authors have responded helpfully to nearly all of the comments and suggestions made by this reviewer. However, their responses to two points are unsatisfactory. The
second of these points was also a concern of the other reviewer.
The first point concerns references to papers by Park et al. [2013] and Kim et al. [2014].
Lines 72-78: "According to the statistical analysis of CHAMP satellite data during one solar cycle, Park et al. [2013] found that Pc1 waves are mostly linearly polarized, having a peak occurrence at sub-auroral latitudes, and weakly dependent on magnetic activity and the solar wind velocity. The Swarm data show a peak occurrence rate of Pc1 waves 75 at middle latitude including sub-auroral region. Moreover, these waves are linear 76 polarization dominated, propagating oblique to the background magnetic field, and 77 preferably occur during the late recovery phase of magnetic storms [Kim et al. 2018a]. "
The authors' reply is the following: "Surely, Park et al., 2013 and Kim et al., 2018 all proved that the peak occurrence rate of Pc1 waves is at midlatitude including subauroral region, so we used "sub-auroral region" instead of "auroral zone" (see line: 73)."
The authors' reply is technically correct, but only to the extent that data in the auroral zone was excluded from these two studies. This was stated explicitly in the Park et al. (2013) paper, and was implicit in the Kim et al. (2018) paper as well. If the authors' reply is taken literally, it contradicts numerous studies of Pc1 waves using high altitude spacecraft, which travel in regions where these waves are generated. The exclusion of data from the auroral zone in these two studies needs to be stated in this paper as well,

Reply:

Yes, I see.
Because the auroral field-aligned currents mask the Pc1 pulsations in the high latitude auroral zone. The Pc1 events at auroral latitudes are rarely detected. Therefore, Park et al. 2013 and Kim et al. 2018 's results that the peak occurrence rate of Pc1 waves is at midlatitude including sub-auroral region are obtained when the high latitude data are excluded (see lines 72-80).

The second point concerns Figure 10 and its description in the text and figure caption.
Lines 225-233: "The blue dots correspond to the position of the plasmapause and the red star represents the conjugate location of Pc1 waves observed by CSES in the Southern hemisphere. From 11 to 21 MLT there is a plume rotating with the plasmasphere in the eastward direction. Such plumes are mostly formed during geomagnetic storm recovery phase [Pierrard and Cabrera, 2005]. Additionally, the plasma refilling process after the geomagnetic storms and substorms is included in this kinetic plasmasphere model. Between 02 and 05 MLT, two blue dots correspond to the inner edge of the refilling region and the outer edge of the plasmasphere and plasma refilling is expected

in this intermediate region [Pierrard and Cabrera, 2005].”
First, the dots (asterisks?) appear to have two different colors: blue and purple. The blue dots appear to trace the plume between 16 and 21 MLT, and two dots beyond L =6 are blue, but all of the other dots appear to be purple.
Second, between 02 and 05 MLT there are two series of purple dots (not two dots).
This reviewer recommends changing one of the two colors of the dots/asterisks, and correcting the text to better match what is in this figure. As the other reviewer noted, local time should also be labeled (6, 12, 18, 0 or 24).

Reply:

Firstly, Figure 10 was produced by the CCMC web. All of the dots (including dark and light blue dots) correspond to the position of the plasmapause. Particularly, from 11 to 21 MLT there is a plume rotating with the plasmasphere in the eastward direction marked by light blue dots. Similar figures are adopted in many papers (e.g. Verbanac et al., 2018), mentioning “dots” instead of “asterisks”, although we are also not sure as the reviewer whether these are dots or asterisks. As for the shades of the symbol, we could not find any explanations. Since we are only concerned about the position of the plasmapause, we just assume the shade is a technical issue when plotting the figure.

Secondly, the plasmapause at any chosen time is determined by the interchange mechanism and by the history of geomagnetic activity during the previous 24 h. The simulation cycle of dynamic plasmasphere model from CCMC always start at 02 MLT because the plasmas are unstable at post-midnight since the convection electric field has the largest value. Additionally, the simulation does not stop after one full cycle at 02 MLT but continues farther up to 05 MLT which means that each simulation covers 27 MLTs. That's why it has two plasmapause branches between 02 MLT and 05 MLT. And the gaps are caused by the loss of some of the plasma elements at large Kp jumps [Verbanac et al., 2018; Bandic at al., 2020] (see lines: 227-237).

Thirdly, the magnetic local times are labeled in Figure 10 as suggested (see line: 507).