Reply to Editor's Comments

Dear Parihar et al.!

Thank you for revising the manuscript. I have tried twice to hear the opinion of the referee that has recommended rejection of your manuscript, but it has just declined to revise the manuscript again. I have checked your responses and improvements in the manuscript and in my opinion the manuscript has improved significantly. Before recommending it for publication, I have some technical issues listed below to be addressed. My apologies for taking so long the peer-view process.

Best regards,

Igo++++++++++

Respected Sir! Please accept our sincere heartfelt thanks for your tremendous encouragement, efforts and critical insight into our submission. We agree with your technical concerns w.r.t. Clarity of Figures, Mean TEC variations and ROTI, and have tried our level best to address them in this Revised Version.

Technical issues

I agree with the referee that it is not easy to see GW structures neither the supplement video nor Figures 1 and 2. Please, try to improve them. Maybe using original images it could be clear. I could not find the meaning of S1, S2, etc in the captions of Figures 1 and 2 in the manuscript. Same comment to Figures 6 and 7.

Reply: Sincere thanks for this critical observation. As suggested, we used Original images to seen GW features but were unable to visualize them. Hence, we improved the contrast of processed airglow images and regenerated these Figures and Supplementary Movie. Corrected Figures along with Captions are as under as:
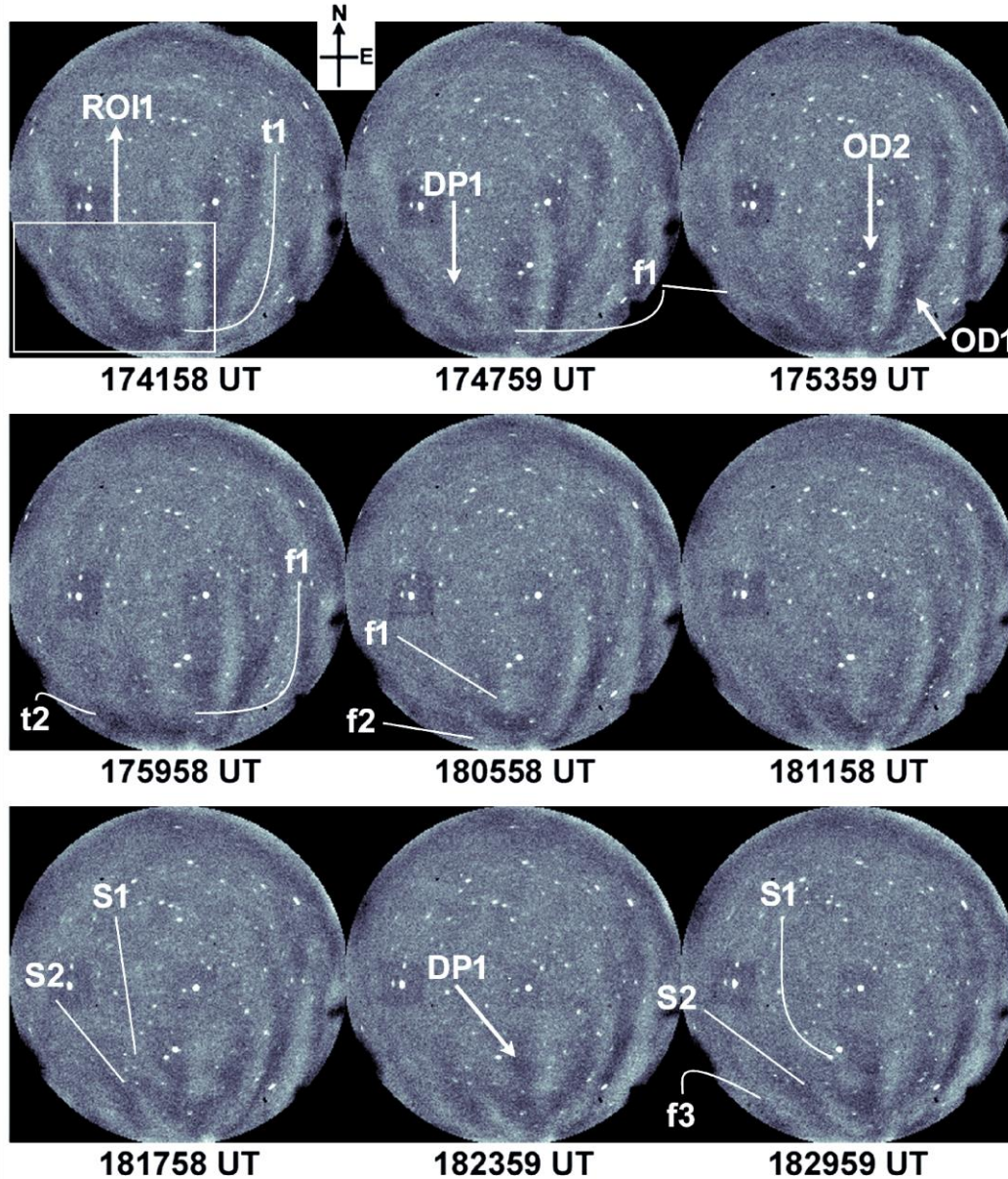
Figure 1. ASAI images during 1742-1830 UT over Ranchi (23.3º N, 85.3º E, mlat. ~19º N) on 16 April 2012. DP1 is the first fossil plasma depletion that showed GWs driven revival. Depletions OD1 and OD2 preceded depletion DP1. ROI1 is the region-of-interest wherein the south-north propagating GW activity and faint signatures of eastward drifting depletion DP1 were seen initially. Some weakly noticeable GWs fronts are 'f1', 'f2' and 'f3' (in succession). 't1' and 't2' are trough that precede fronts 'f1' and 'f2', respectively. Upon interaction with depletions present in ROI1, EW-aligned GW fronts 'f1' and 'f2' fragmented and formed structures 'S1' and 'S2' that, subsequently, got linked to the west wall of depletion DP1 and started moving in unison.
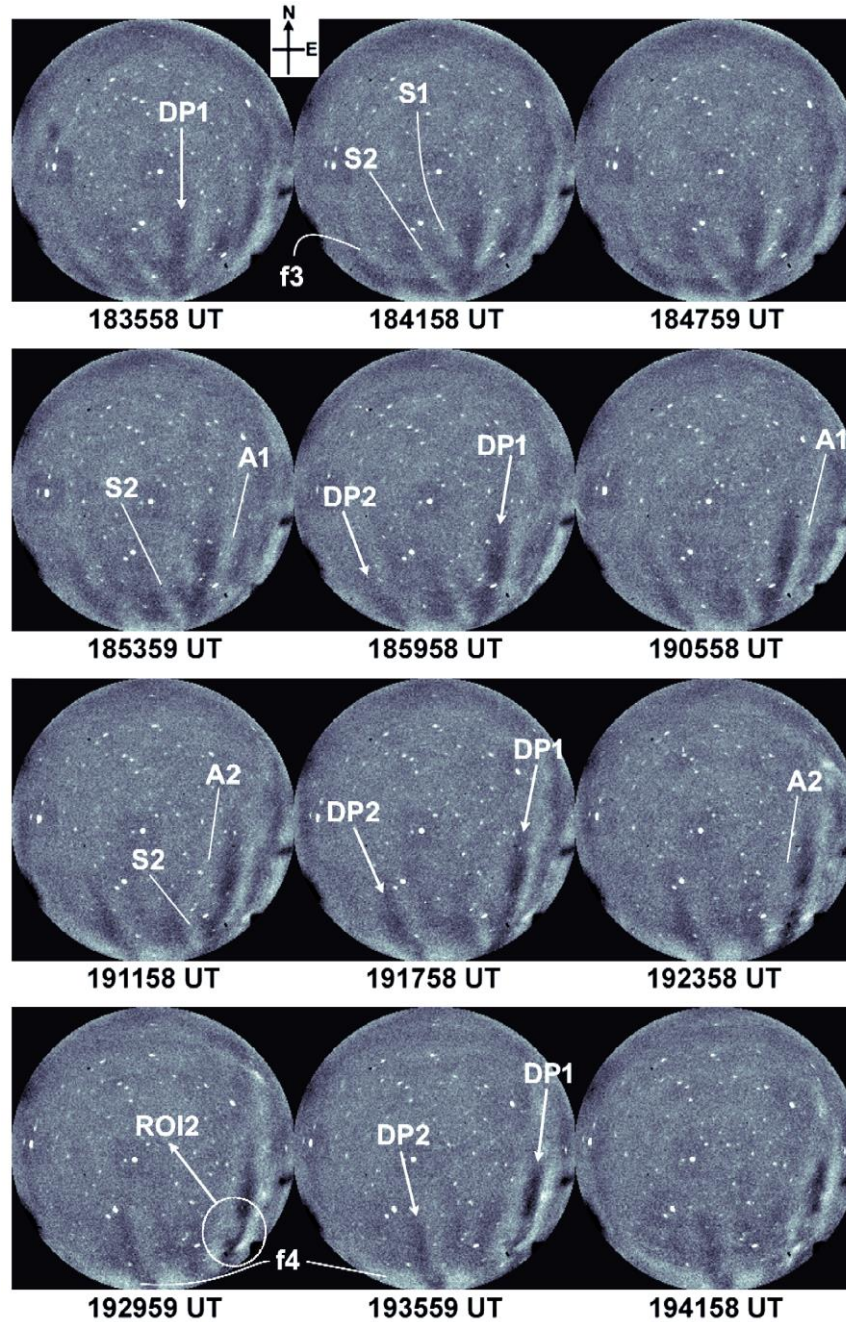
Figure 2. Airglow images showing the subsequent evolution of depletion DP1 during 1836-1942 UT. On course of their eastward motion, structures 'S1' and 'S2' significantly tilted to east, aligned with the west wall of depletion DP1 and contributed to its revival. DP2 is another fossil depletion that showed GWs driven revival. Some noticeable GWs fronts are 'f3' and 'f4'. A1 and A2 are two arc-shaped regions of airglow enhancement near the east and west wall of depletion DP1. ROI2 is the region-of-interest wherein ambient plasma diffusion occurred across the west wall of depletions DP1.
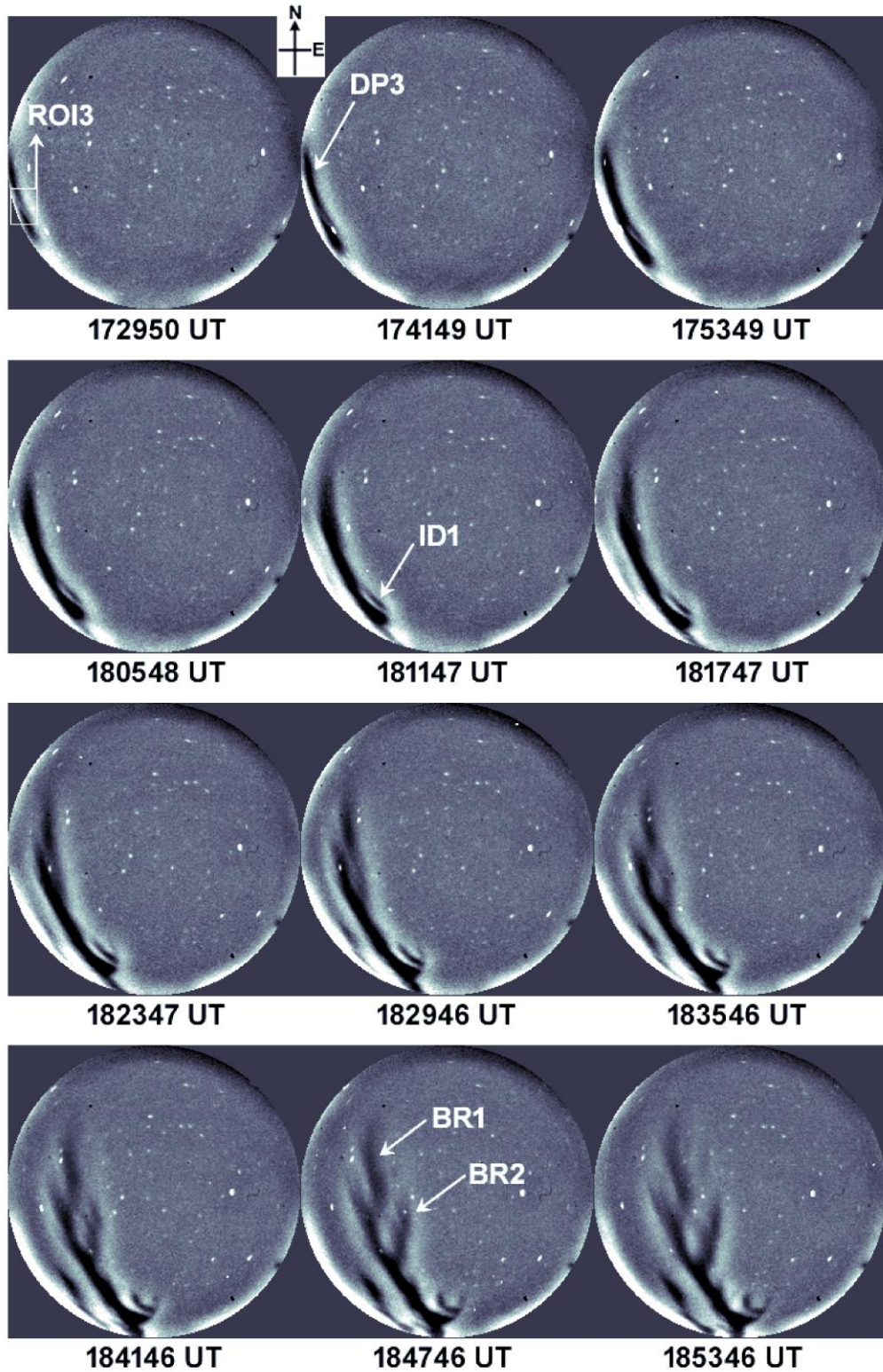
Figure 6. Selected ASAI images showing the revival of fossil depletion **DP3** during 1730-1854 UT on 06 March 2013 over Ranchi. **ROI3** is the region-of-interest wherein depletion **DP3**

appeared sliced by an unclear thin streak of slightly enhanced airglow. **BR1** and **BR2** are two structuring that developed on its east wall.
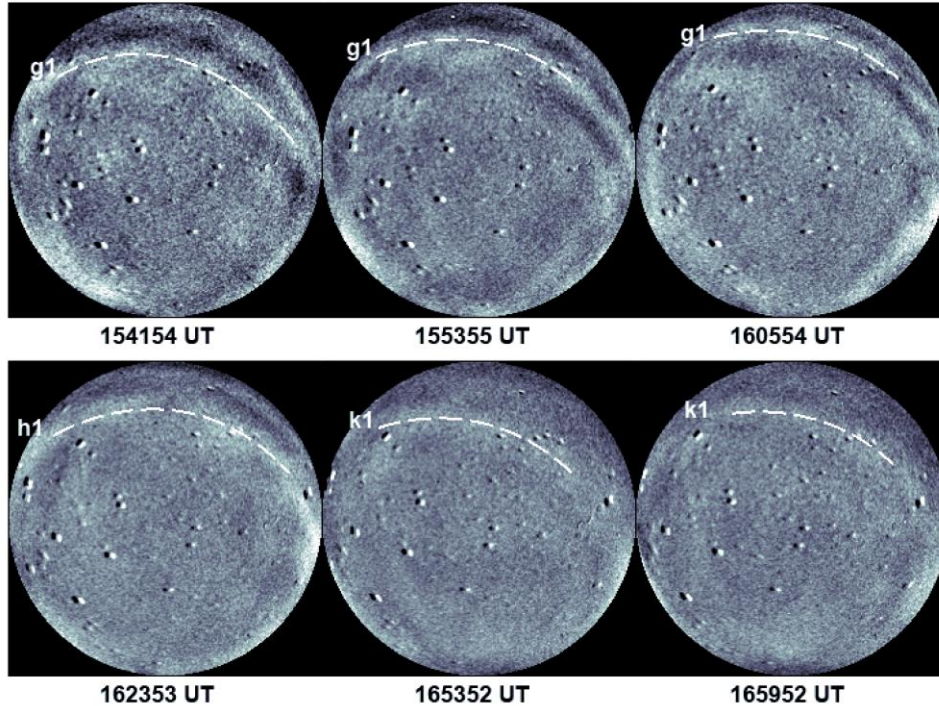
Figure 7. Limited time difference ASAI images showing GW activity during 1530-1700 UT on 06 March 2013. Beginning 1336 UT, GW signatures were seen in airglow images; however, activity intensified during 1530-1736 UT. Some of clear GW fronts are marked as 'g1', 'h1' and 'k1'.

Regarding Figure 5, how are the mean values of the TEC during that time? In fact the TEC is very close to what is expected to be an EPB. Maybe a plot including the TEC, the fluctuation and the ROTI itself could help you in this interpretation.

Reply: Many thanks for this invaluable suggestions which helped us to interpret our observations in a better way. As suggested, we have revised Figure 5 as under and have added Figure 5 (c) showing Mean TEC and ROTI variations over Hyderabad (which is located equatorward of the Airglow Site).
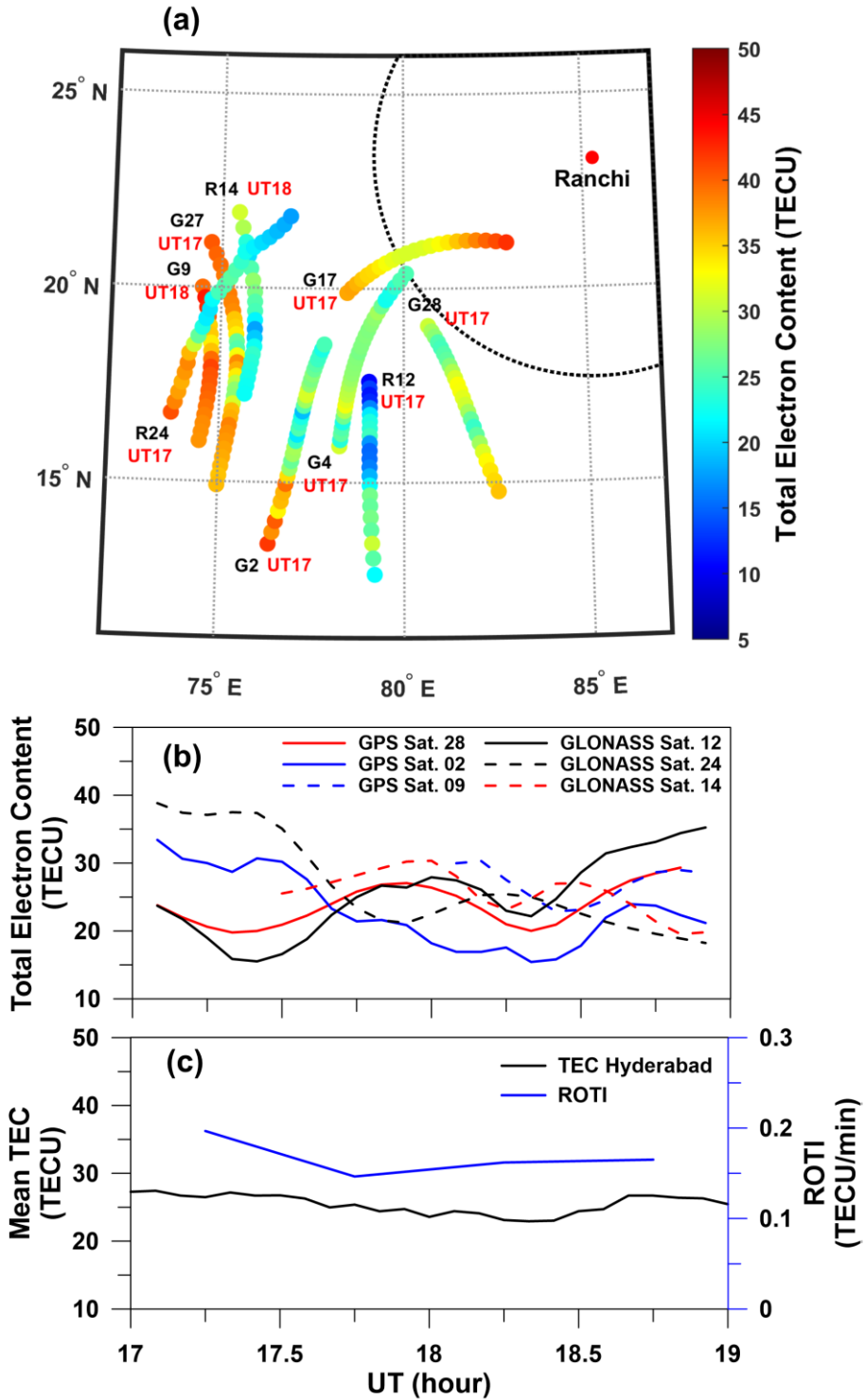
Figure 5. (a) Scatter plot of the TEC along the track of IPPs for a few GPS and GLONASS satellites (prefixed as 'G' and 'R', respectively) in the geographic grid of 5-35° N x 65-95° E during 1630-1930 UT on 16 April 2012. PRN numbers of GPS/GLONASS satellites along with the start time at 1700 UT are marked adjacent to the corresponding IPPs trajectory. G28's

trajectory lay close to the south-west sector of the ASAI. Imager's field-of-view is shown by dashed quarter circle with its centre at Ranchi. (b) TEC variations of a few GPS/GLONASS satellites showing the presence of GWs activity. (c) Mean TEC and ROTI variation over Hyderabad (17.3° N, 78.6° E, mlat. ~12.0° N, located equatorward of Ranchi).