

## ***Interactive comment on “Postmidnight equatorial plasma irregularities on June solstice during low solar activity – a case study” by Claudia M. N. Candido et al.***

### **Anonymous Referee #1**

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In this paper, the authors reported a case of equatorial F region plasma irregularities appearing at post-midnight over Brazil. The irregularity first appeared around the F layer peak and then evolved into mixed spread-F. Simultaneous airglow observations showed plasma depletions drifting westward. By employing the simultaneous digisonde and FPI measurements, the authors suggested that the generation of midnight F region irregularities could be linked with the uplift of F layer at late night which favor the development of RT instability. I recommend the paper for publication in AG.

Specific comments are as follows, 1. lines 59-61, there have been a lot of papers on June solstitial post-midnight F region irregularities. Although post-sunset F region

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irregularities were addressed in the review paper by Balan et al. (EPP, 2018), another review paper by Otsuka (PEPS, 2018, Review of the generation mechanisms of post-midnight irregularities in the equatorial and low-latitude ionosphere) is closely relevant to the topic and should also be referenced here.

2. lines 126-128, the authors mentioned that the post-midnight F region irregularity is unusual compared to post-sunset F region irregularity. However, post-midnight F region irregularities have been widely investigated. Is the present case significantly different from the post-midnight F region irregularities reported earlier?

3. lines 336-340, for the present case, is it possible that the irregularities generated at eastern longitudes of Cajazeiras after sunset when the irregularities drifted eastward slowly, and some time later, the irregularities drifted westward and then were observed by the imager at Cajazeiras? If so, the case would be similar to previous observations.

4. lines 534, Please clarify what is the "anomalous pattern". Westward drifts of F region irregularities at post-midnight during geomagnetic quiet conditions are not rare.

5. lines 544, as mentioned above, what is the distinct feature compared to previous results of post-midnight F region irregularities?

6. lines 548-551, it looks like that all the known factors affecting the generation process of F region irregularities are possible. If so, the conclusion does not make sense. Is it possible to determine the main factor(s) causing the generation of post-midnight irregularities through a quantitative simulation in terms of the ionosonde and FPI observations?

7. Figure 3, it's difficult to find the depletion. Please highlight the structure in the plot.

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Interactive comment on Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2018-115>, 2018.

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