Review reports for the manuscript titled ‘Ionospheric responses to the 14 October 2023 annular solar eclipse over Brazil: A case study of fixed-frequency isoline variations’ by Paulino et al. (2026).

Summary

This manuscript presents a case study of the ionospheric response to the 14 October 2023 annular solar eclipse using ionosonde observations from three locations in the Brazilian sector: Araguatins, Jataí, and São José dos Campos. This manuscript reports altitude variations in the iso-frequency observations from the three ionosonde stations during and after the eclipse. This study uses ionograms with 5-minute temporal resolution and fixed-frequency observations at 1.67 minutes, which is a very useful experimental setup for investigating eclipse-induced variations (height/density) in the ionosphere. The results are quite interesting and insightful, and have the potential to help the community better understand eclipse-induced ionospheric variations. However, in the current form, the manuscript contains some unclear interpretations of the results. Before publication, the reviewer wants the authors to revise the manuscript to improve clarity and the physical interpretation of the results shown in the figures.

Below are some minor comments/suggestions.

Minor Comments/Suggestions

- Physical Mechanism

  Line 6: ‘Results demonstrate reduction in altitude…’ In the line, the author reported a reduction in altitude of the iso-frequency observation at all stations following the onset of the partial eclipse. For instance, what can I see from the figure 2, the lower frequencies shows increase in altuitude in the growth of the eclipse and in the recovery phase of the eclipse there is a decrease in altitude, but for the higher frequencies (7-8 MHz) there is a dip after the eclipse onset and then slight increase and a delayed dip in the recovery phase. So make it clear in your abstract and the discussion about these variations, as these variations are the key observation of the manuscript. And what is the plausible mechanism causing these variations?? For example, Barad and Sripathi (2023) reported both iso-height and iso-frequency variations during the 15 January 2010 annular solar eclipse, with a temporal resolution of 2 minutes, similar to this study.

You can also find various literature on height/density variations during the eclipse. Kindly review these investigations and prepare a more thorough discussion.

- As the eclipse occurs in the local afternoon and the end is toward dusk, it would be very helpful for readers if you could add the sunset terminator to the plots as a reference for evening-time ionospheric variations.
- Could you please calculate the height variations during the eclipse period using the quiet-time base values, or the percentage change in height?
- If possible, could you show the EEJ variations to clearly interpret the role of electric fields during the eclipse and their impact on the EXB drift, causing these height variations during the eclipse passage?
- Can you quantify, for different stations, the actual time lag between the maximum obscuration and the maximum decrease in altitude of the iso-frequency observations to better understand the physical processes?
- Line 28 ‘and enhacement in’… correct it.
- Line 51 ‘approximately 70%’, …provide the correct obscuration.
- In line 207 ‘? demonstrated’… correct the typo.
- Line 229 ‘only 39%’…Give the actual value.