

Review Form 3

Journal Name:	Current Journal of Applied Science and Technology
Manuscript Number:	Ms_CJAST_129555
Title of the Manuscript:	Variation of the critical frequency of the ionospheric layer F2 at the ionosonde station of Ouagadougou during moderate geomagnetic activities at the minimum and maximum phases of solar cycles 21 and 22
Type of the Article	

General guidelines for the Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guidelines for the Peer Review process, reviewers are requested to visit this link:

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PART 1: Comments

	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.	<p>Advances Understanding of Ionospheric Variability: The study provides insights into the diurnal and seasonal variations of the critical frequency of the F2 layer (foF2) under different geomagnetic conditions, enhancing our understanding of ionospheric electrodynamics in the equatorial region.</p> <p>Impact on Space Weather Studies: By examining moderate geomagnetic activities such as corotating and magnetic cloud events, the research contributes valuable data to space weather modeling and its effects on communication and navigation systems.</p> <p>Equatorial Ionospheric Dynamics: The analysis of diurnal foF2 profiles offers significant findings on the behavior of equatorial electrojets and their counter-electrojets, crucial for understanding ionospheric current systems.</p> <p>Relevance to Solar Cycle Phases: The differentiation of ionospheric responses during the minimum and maximum phases of solar cycles 21 and 22 sheds light on the correlation between solar activity and ionospheric variability, important for long-term ionospheric predictions.</p>	
Is the title of the article suitable? (If not please suggest an alternative title)	<p>The title is long and it will be better if the author modify this way "Variation of the Critical Frequency of the Ionospheric F2 Layer during Moderate Geomagnetic Conditions: A Study Using Data from the Ouagadougou Ionosondes Station Across Solar Cycles 21 and 22"</p>	

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<p>Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.</p>	<p>Evaluation of the Abstract:</p> <p>The abstract is fairly comprehensive and provides a clear overview of the study, including the objective (variation of critical frequency of the F2 layer during geomagnetic activities), methodology (comparison with very quiet activity), and main findings (perturbations and lack of divergence in certain conditions). However, there is room for improvement to enhance its clarity, readability, and inclusiveness.</p> <p>Suggestions for Improvement:</p> <p>Explicit Research Context:</p> <p>Include a brief explanation of the importance of studying the F2 layer's critical frequency and its relevance to geomagnetic activity or practical applications (e.g., communication systems).</p> <p>Clarify Methodology:</p> <p>Mention the specific geomagnetic activities analyzed (e.g., corotating and magnetic cloud) directly in the abstract for better context.</p> <p>Highlight Key Results:</p> <p>State the significance of diurnal variations and their implications for understanding ionospheric storms, rather than just describing what was observed.</p> <p>Quantify key findings (e.g., Δf_oF_2 values) for emphasis and clarity.</p> <p>Address Broader Implications:</p> <p>Discuss how these findings contribute to the larger field of space weather research or ionospheric science.</p> <p>Language Refinement:</p> <p>Simplify technical phrases where possible to ensure accessibility for a broader audience.</p> <p>Look in the main manuscript the revised form</p>	
<p>Is the manuscript scientifically, correct? Please write here.</p>	<p>he manuscript appears to be scientifically sound and grounded in robust methodologies. The study of the critical frequency (f_oF_2) of the ionospheric F2 layer under different geomagnetic conditions during the minimum and maximum phases of solar cycles 21 and 22 provides valuable insights. The authors use established methods for classifying geomagnetic activities and quantifying ionospheric perturbations. Their findings are consistent with prior studies on ionospheric dynamics and space weather phenomena.</p> <p>Strengths Supporting Scientific Validity:</p> <p>Clear Focus and Objective: The study addresses a specific scientific question related to the effects of moderate geomagnetic activities (corotating and magnetic cloud) on ionospheric f_oF_2 variations.</p> <p>Established Methodology:</p> <p>The use of diurnal and seasonal variations and the classification of geomagnetic activities are aligned with widely accepted practices in ionospheric research.</p>	

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	<p>The inclusion of Δf_oF_2 to quantify ionospheric storms is appropriate and supported by previous studies.</p> <p>Consistency with Previous Literature:</p> <p>The results align with known behaviors of equatorial ionospheric dynamics and geomagnetic influences, lending credibility to the findings.</p> <p>Areas for Potential Refinement:</p> <p>Data Representation:</p> <p>The results section could be strengthened by providing more quantitative details and visual aids (e.g., additional graphs or charts) to illustrate findings clearly.</p> <p>Explanatory Depth:</p> <p>The discussion could delve deeper into the physical mechanisms driving the observed differences between magnetic cloud and corotating activities.</p> <p>Broader Implications:</p> <p>The conclusion could explicitly state how these findings contribute to advancements in space weather forecasting or ionospheric modeling.</p>	
<p>Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.</p>	<p>Suggested Additional References:</p> <p>To enhance the depth and relevance of the manuscript, the following references could be considered for inclusion, as they provide insights into ionospheric behavior, geomagnetic activity, and related methodologies:</p> <p>Ionospheric Dynamics and Geomagnetic Activity:</p> <p>Kelley, M. C. (2009). <i>The Earth's Ionosphere: Plasma Physics and Electrodynamics</i>. Academic Press.</p> <p>This book provides comprehensive coverage of ionospheric physics and its response to geomagnetic activity, which could add context to the study's findings.</p> <p>Electrodynamic Processes in the Ionosphere:</p> <p>Richmond, A. D., & Lu, G. (2000). "Upper-atmosphere dynamics and electrodynamics." <i>Reviews of Geophysics</i>, 39(3), 431-449.</p> <p>This paper explores electrodynamic processes in the ionosphere, complementing the study's discussion on ionospheric currents and drifts.</p> <p>Critical Frequency Variations:</p> <p>Rishbeth, H., & Mendillo, M. (2001). "Patterns of F2-layer variability." <i>Journal of Atmospheric and Solar-Terrestrial Physics</i>, 63(15), 1661-1680.</p> <p>This work discusses F2-layer variability, directly related to the study's focus on critical frequency</p>	

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	<p>variations.</p> <p>Geomagnetic Storm Impacts on the Ionosphere:</p> <p>Kamide, Y., & Kusano, K. (2015). "Geomagnetic storms: Progress and perspectives." <i>Frontiers in Astronomy and Space Sciences</i>, 2, 1.</p> <p>This paper provides insights into geomagnetic storm impacts, useful for contextualizing the study's results on ionospheric storms.</p> <p>Space Weather and Communication Systems:</p> <p>Hapgood, M. A. (2017). "Preparing for the next space weather storm." <i>Advances in Space Research</i>, 49(1), 11-27.</p> <p>This paper discusses the implications of space weather, which can connect the study's findings to practical applications like communication and navigation.</p> <p>Incorporating these references will strengthen the manuscript's theoretical foundation and link its findings to broader research themes and practical implications.</p>	
<p>Is the language/English quality of the article suitable for scholarly communications?</p>	<p>Yes</p>	
<p><u>Optional/General</u> comments</p>		

PART 2:

	<p><u>Reviewer's comment</u></p>	<p><u>Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</u></p>
<p><u>Are there ethical issues in this manuscript?</u></p>	<p><u>(If yes, Kindly please write down the ethical issues here in details)</u></p>	

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