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| Book Name: | [**Current Research Progress in Physical Science**](https://www.bookpi.org/bookstore/product/current-research-progress-in-physical-science-vol-1/) |
| Manuscript Number: | **Ms\_BPR\_4692** |
| Title of the Manuscript:  | **Analysis of seasonal variation of densities electronic : NmE and NmF boundary of E and F layers of ionosphere in low latitudes, Ouagadougou station** |
| Type of the Article | **Book Chapter** |

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| PART 1: Comments |
|  | Reviewer’s comment**Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | Author’s Feedback *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **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.** | The manuscript advances our understanding of ionospheric dynamics by rigorously analyzing the electron density variations in the E and F layers, particularly under different solar cycle phases, seasons, and local times. It fills a critical gap in the literature by focusing on low-latitude regions of the African sector, an area that is often underrepresented in ionospheric studies. By employing the IRI-2016 model and analyzing data from both solar minimum and maximum phases of solar cycle 23, the study provides robust insights into the interplay between solar irradiation and ionospheric behavior. These findings are pivotal for refining models of radio wave propagation and enhancing predictive capabilities for space weather impacts on communication and navigation systems. |  |
| **Is the title of the article suitable?****(If not please suggest an alternative title)** | **The title is suitable**  |  |
| 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. | **The abstract is comprehensive enough** |  |
| **Is the manuscript scientifically, correct? Please write here.**  | Strengths:1. **Scientific Basis:** The study correctly states that ultraviolet light from the Sun is the primary source of ionization in the Earth's upper atmosphere. The role of the solar cycle, seasonal changes, and local time in affecting electron density variations is well known and aligns with existing literature.
2. **Use of IRI-2016 Model:** The IRI model is a well-accepted semi-empirical model for studying ionospheric parameters, and its use for estimating electron densities is scientifically appropriate.
3. **Critical Frequency Relation:** The relationship between electron density and critical frequency (fp = 9√n) is correctly derived from plasma physics principles.

Issues and Corrections Needed:1. **Confusion in the Solar Cycle Discussion:**
	1. The manuscript states that solar cycle 23's minimum phase was in 1996 and the maximum in 2008. This is incorrect.
	2. Solar cycle 23 had its **minimum phase in 1996** and **maximum phase around 2001**, not 2008. By 2008, the cycle was already declining toward the next minimum. The study should clarify whether data from 2008 was chosen to represent declining solar activity rather than maximum.
2. **Incorrect Seasonal Definitions:**
	1. The manuscript assigns March to spring, June to summer, September to autumn, and December to winter. However, this classification is for temperate regions.
	2. Ouagadougou (12.4°N) is in the **tropics**, where seasons are better classified as **wet and dry seasons** rather than the four-season model. The study should address this and clarify the impact of seasonal classification on results.
3. **Assumption of Near-Zero Electron Density at Night:**
	1. The claim that NmE and NmF are “almost zero” at night (0 LT – 6 LT for E layer, 0 LT – 8 LT for F layer) is **not entirely correct**.
	2. While electron densities do decrease significantly at night due to recombination, they **do not drop to zero** because of ionization from cosmic rays, starlight, and residual daytime ionization. A comparison with real observations (from ionosondes) would strengthen the study.
4. **Ambiguous Use of "Boundary of Layers E and F":**
	1. The manuscript frequently refers to “the boundary of layers E and F at 150 km.” However, **layer E is typically at ~90–120 km, and layer F starts around 150 km**.
	2. Clarify whether the study focuses on NmE (closer to 100 km) and NmF (closer to 200–300 km) separately or on a specific transitional region.
5. **Calculation and Data Handling Issues:**
	1. The study uses an averaging method for NmE and NmF over five quiet days but does not mention how uncertainties are handled.
	2. Statistical errors (e.g., standard deviation) should be provided to assess variability.
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| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.****-** | **References are enough** |  |
| Is the language/English quality of the article suitable for scholarly communications? | Yes |  |
| Optional/General comments |  |  |

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| **PART 2:**  |
|  | Reviewer’s comment | Author’s comment *(if agreed with the reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Are there ethical issues in this manuscript?**  | *(If yes, Kindly please write down the ethical issues here in detail)* |  |

**Reviewer details:**

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