Patrick Essien

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PROFILE

Patrick Essien holds a PhD in Space Geophysics from National Institute for Space Research in Brazil. His research interests focus on the effects of space weather and ionospheric conditions on Global Navigation Satellite Systems (GNSS) and their applications. He also does research into the neutral atmospheric forcing and its effects on the ionosphere.

RESEARCH

Interests	Space Weather and ionospheric/Atmospheric Physics · Traveling Ionospheric Disturbances · Gravity Waves · irregularities · GLONASS · GPS · Total Electron Cont
Areas	Astronomy and Astrophysics · Geophysics · Aerospace Engineering · Atmospheric Science · Global and Planetary Change · Oceanography

RESEARCH SUMMARY

19	149	8	6	0.87	0%
Publications	Citations	h-index	i10-index	Field-weighted impact	World top 10%

Counted from the 19 publications listed below, 2015–2025. Field-weighted impact is the mean over the 9 works scored for it; 1.00 is the world average for works of the same field, type and year. 0 of the 9 papers scored for it are among the world's most cited tenth for their field, type and year.

POSITIONS

Postdoctoral Fellowship 2021–2023
AIMS-Canada Postdoctoral Fellowship, African Institute for Mathematical Sciences Rwanada, Kigali, Rwanda

Consultant/Postdoc/Tutor 2021
Climate Change and Atmospheric Physics, African Institute For Mathematical Sciences Ghana, Accra, Ghana

Teaching Assistant 2011–2012
Physics, University of Cape Coast, Cape Coast, Ghana

EDUCATION AND QUALIFICATIONS

PhD. Space Geophysics 2016–2020
Aeronomy, National Institute for Space Research, São José dos Campos, Brazil

MSc. Physics of Upper Atmosphere 2014–2016
Unidade Acadêmica de Fisica, Universidade Federal de Campina Grande, Campina Grande, Brazil

PgD. Satellite Communication 2013
Satellite Communication (SATCOM), Africa Regional Center for Space Science and Technology Education in English, Ile-Ife, Nigeria

BSc. Engineering Physics 2007–2011
Physics, University of Cape Coast, Cape Coast, Ghana

Mechanical Engineering Technician 2000–2001
School of Engineering, Takoradi Polytechnic, Takoradi, Ghana

DISTINCTIONS, MEMBERSHIPS AND SERVICE

Student 2019–present
Space Physics and Aeronomy, American Geophysical Union, DC, United States

European Geosciences Union 2018–present
Munich, Germany

Simpósio Brasileiro de Geofísica Espacial e Aeronomia (SBGEA) 2016–present
Sao Jose dos Campus, Brazil

PUBLICATIONS

Journal articles 18

1. Francis Nkrumah, Gandome Mayeul Leger Davy Quenum, Kwesi A Quagraine, Simone Tilmes, Nana Ama Browne Klutse, Atanas Dommo, Hubert A Koffi, **Patrick Essien**, Rebecca Bediako (2025). Climate response to stratospheric aerosol injection during the Harmattan season in West Africa. *Environmental Research Climate*. https://doi.org/10.1088/2752-5295/adaa0c
2. Toyese Tunde Ayorinde, Cristiano Max Wrasse, Hisao Takahashi, Luiz Fernando Sapucci, Mohamadou A. Diallo, Cosme Alexandre Oliveira Barros Figueiredo, Diego Barros, Ligia Alves da Silva, **Patrick Essien**, Anderson Vestena Bilibio (2025). Modulation of tropical stratospheric gravity wave activity and the ITCZ position by modes of climate variability using radio occultation and reanalysis data. *Atmospheric chemistry and physics*. https://doi.org/10.5194/acp-25-12357-2025
3. Nana Ama Browne Klutse, Babatunde J. Abiodun, Kwesi A. Quagraine, Francis Nkrumah, Abayomi A. Abaton, Jimmy Adekoke, Mouhamadou Bamba Sylla, Rebecca Berkoh-Oforiwaa, Hubert A. Koffi, **Patrick Essien** (2024). Projected Changes in Rainfall Extremes over West African Cities Under Specific Global Warming Levels Using CORDEX and NEX-GDDP Datasets. *Earth Systems and Environment*. https://doi.org/10.1007/s41748-024-00425-w
4. Solomon Otoo Lomotey, Jonas Rodrigues de Souza, Cristiano Max Wrasse, Hisao Takahashi, Diego Barros, Cosme Alexandre Oliveira Barros Figueiredo, José Humberto Andrade Sobral, Fábio Egito, **Patrick Essien**, Toyese Tunde Ayorinde, Anderson Vestena Bilibio, Nana Ama Browne Klutse (2024). Variability of the equatorial ionization anomaly over the South American sector: Effects of electric field and effective meridional wind. *Journal of Atmospheric and Solar-Terrestrial Physics*. https://doi.org/10.1016/j.jastp.2024.106240
5. Francis Nkrumah, Cornelia Klein, Kwesi Akumenyi Quagraine, Rebecca Berkoh-Oforiwaa, Nana Ama Browne Klutse, **Patrick Essien**, Gandomè Mayeul Leger Davy Quenum, Hubert Azoda Koffi (2023). Classification of large-scale environments that drive the formation of mesoscale convective systems over southern West Africa. *Weather and Climate Dynamics*. https://doi.org/10.5194/wcd-4-773-2023
6. Toyese Tunde Ayorinde, Cristiano Max Wrasse, Hisao Takahashi, Diego Barros, Cosme Alexandre Oliveira Barros Figueiredo, Solomon Otoo Lomotey, **Patrick Essien**, Anderson Vestena Bilibio (2023). Stratospheric gravity wave potential energy and tropospheric parameters relationships over South America: a study using COSMIC-2 and METOP radio occultation measurements. *Earth Planets and Space*. https://doi.org/10.1186/s40623-023-01891-8
7. **Patrick Essien**, Cosme Alexandre Oliveira Barros Figueiredo, Hisao Takahashi, Nana Ama Browne Klutse, Cristiano Max Wrasse, João Maria de Sousa Afonso, David Pareja Quispe, Solomon Otoo Lomotey, Tunde Toyese Ayorinde, José H. A. Sobral, Moses Jojo Eghan, Samuel Sanko Sackey, Diego Barros, Anderson V. Bilibio, Francis Nkrumah, Kwesi Akumenyi Quagraine (2022). Intertropical Convergence Zone as the Possible Source Mechanism for Southward Propagating Medium-Scale Traveling Ionospheric Disturbances over South American Low-Latitude and Equatorial Region. *Atmosphere*. https://doi.org/10.3390/atmos13111836
8. Hisao Takahashi, Cosme A. O. B. Figueiredo, **Patrick Essien**, Cristiano M. Wrasse, Diego Barros, Prosper K.

Nyassor, Igo Paulino, Fabio Egito, Geangelo M. Rosa, Antonio H. R. Sampaio (2022). Signature of gravity wave propagations from the troposphere to ionosphere. *Annales Geophysicae*. https://doi.org/10.5194/angeo-40-665-2022

9. **Patrick Essien**, Cosme Alexandre Oliveira Barros Figueiredo, Hisao Takahashi, Cristiano Max Wrasse, Diego Barros, Nana Ama Browne Klutse, Solomon Otoo Lomotey, Toyese Tunde Ayorinde, Delano Gobbi, Anderson V. Bilibio (2021). Long-Term Study on Medium-Scale Traveling Ionospheric Disturbances Observed over the South American Equatorial Region. *Atmosphere*. https://doi.org/10.3390/atmos12111409
10. **P Essien** (2021). Multi-instrument study of longitudinal wave structures for plasma bubble seeding in the equatorial ionosphere. *Earth and Planetary Physics*. https://doi.org/10.26464/epp2021047
11. **Patrick Essien** (2021). Study on Atmospheric gravity wave propagations in the Troposphere, Stratosphere and Mesosphere using GNSS Satellite Radio Occultation measurements. *Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 8 (SBGEA)*. http://bibdigital.sid.inpe.br/sid.inpe.br/bibdigital/2022/04.03.17.52/goto/sid.inpe.br/mtc-m21c/2021/11.25.16.37?ibiurl.backgroundlanguage=pt-BR&searchinputvalue=languagebutton&parentidentifiercitedby=8JMKD3MGPCW/46KTFK8+8JMKD3MGPCW/46KTH32&forcerecentflag=0&forcehistorybackflag=1
12. Nana Ama Browne Klutse, **Patrick Essien** (2021). Temporal and Longitudinal Climatological Studies of the Equatorial Ionization Anomaly as Observed by Ground-Based Gnss Receiver Networks Over South America. *43rd COSPAR Scientific Assembly. Held 28 January-4 February*. https://ui.adsabs.harvard.edu/abs/2021cosp...43E.626O/abstract
13. **P Essien** (2020). Equatorial plasma bubble occurrence under propagation of MSTID and MLT gravity waves. *Journal of Geophysical Research: Space Physics*. https://doi.org/10.1029/2019ja027566
14. **P Essien** (2020). Nighttime ionospheric TEC study over Latin America during moderate and high solar activity. *Journal of Geophysical Research: Space Physics*. https://doi.org/10.1029/2020ja028210
15. **Patrick Essien** (2019). Seasonal variation of plasma bubbles during solar cycle 23–24 over the Brazilian equatorial region. *Advances in Space Research*. https://www.sciencedirect.com/science/article/pii/S0273117719304909
16. **Patrick Essien** (2018). Seasonal characteristics of small-and medium-scale gravity waves in the mesosphere and lower thermosphere over the Brazilian equatorial region. *Annales Geophysicae*. https://angeo.copernicus.org/articles/36/899/2018/
17. **Patrick Essien** (2016). Estimation of the parameters of gravity waves combining ground based and satellite measurements. *41st COSPAR Scientific Assembly*. https://ui.adsabs.harvard.edu/abs/2016cosp...41E1537P/abstract
18. **Patrick Essien** (2016). Long-Term Observation of Small and Medium-Scale Gravity Waves over the Brazilian Equatorial Region. *41st COSPAR Scientific Assembly*. https://ui.adsabs.harvard.edu/abs/2016cosp...41E.555E/abstract

Reports 1

1. **Patrick Essien** (2015). Observações de longo prazo de ondas de gravidade de média escala sobre a região equatorial brasileira. *Universidade Federal de Campina Grande*. https://dspace.sti.ufcg.edu.br/handle/riufcg/3587