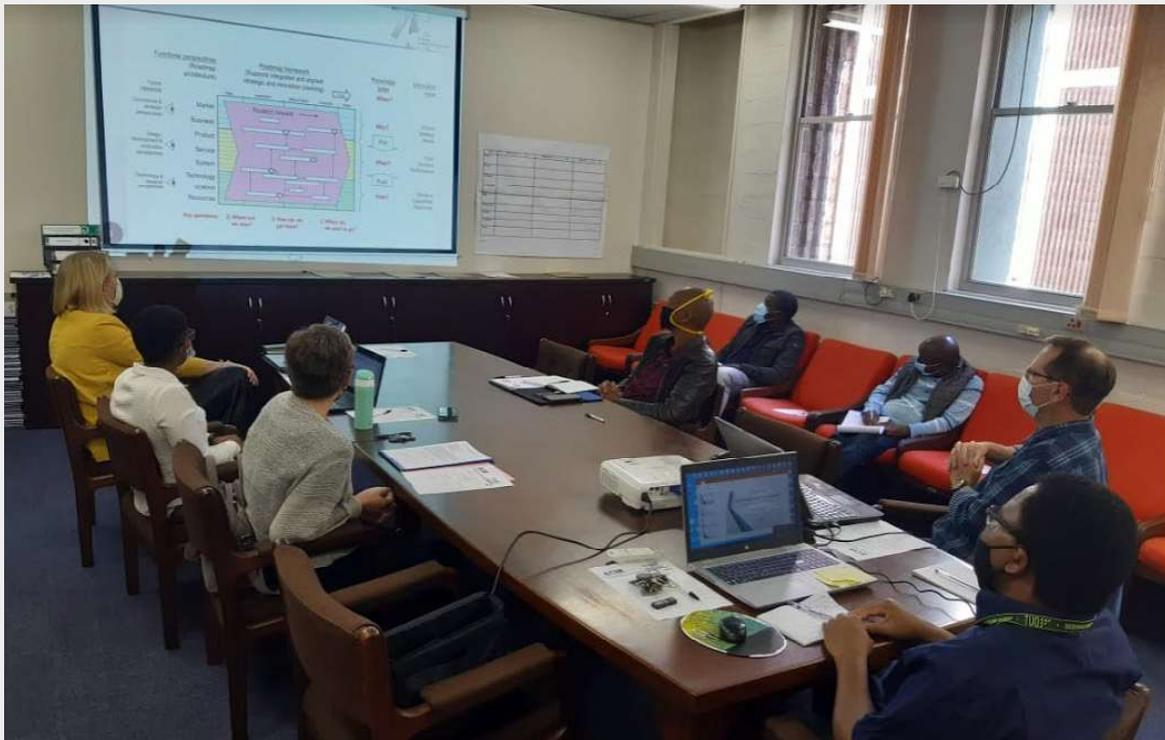


DUT-CSIR Economic Case for Space Phase II

The Department hosted a workshop session between CSIR and DUT members for the development of a Global Navigation Satellite System (GNSS) Roadmap for South Africa. A presentation, "An Economic Case for Space Phase II" was made by Mr Erik Wegman. The aim of the presentation was to develop a GNSS Technology roadmap. Prof IE Davidson gave an overview presentation on the status of DUT with regards to Space Science, including the highlights, challenges and future plans. This is an ongoing project that will greatly impact the country.



From left to right: Mrs. Regina Naidoo, Ms. Nomusa Zakuza, Mr. Jonas Dakora, Me Busisiwe Nkonki, Me Saloshnee Naidoo, Mr. Joe Dlamini, Me Marie Botha, Mr. Erik Wegman, Prof Innocent Davidson (Photographer: Dr Elutunji Buraimoh)

Book Chapter

[1] **Innocent E. Davidson, Rodney Reddy,** Battery Energy Storage Systems and Rooftop Solar-Photovoltaics in

Electric Power Distribution Networks. In: Kenneth Eloghene Okedu, "Energy Storage Devices", IntechOpen, Open Access book, 2021.

Journal Papers

- [1] **E. Buraimoh** and **I.E. Davidson**, " Fault Ride-Through Analysis of Current-and Voltage-Source Models of Grid Supporting Inverter-Based Microgrid," *IEEE Canadian Journal of Electrical and Computer Engineering*, Vol. 44, no.2, pp.189-198, 2021.
- [2] **Patrobers Simiyu, I.E Davidson**, "MVDC Railway Traction Power Systems; State-of-the Art, Opportunities, and Challenges", *Energies*-1233187, July 2021.

Peer-Reviewed Conferece Papers

- [1] **Anyanime Umoette**, Ogbonnaya Okoro and **Innocent Davidson**, "Performance Analysis of a 10hp Three phase Induction Motor Using Classical and Finite-Elements for Varying Load Conditions". Paper accepted and to appear, in *Proceedings 2021 IEEE PES/IAS Power Africa Virtual Conference*, 23 – 27 August 2021.
- [2] **Sindisiwe Malanda** and **Innocent Davidson**, "DC Pole-to-Ground Fault Analysis in a 4-Point VSC Multi-Terminal HVDC Transmission System". Paper accepted and to appear, in *Proceedings 2021 IEEE PES/IAS Power Africa Virtual Conference*, 23 – 27 August 2021.
- [3] **Emmanuel Abunike**, Ogbonnaya Okoro and **Innocent Davidson**, "Design Considerations and Performance Prediction of an External Rotor 6/10 Switched Reluctance Motor for Electric Vehicle Applications". Paper accepted and to appear, in *Proceedings 2021 IEEE PES/IAS Power Africa Virtual Conference*, 23 – 27 August 2021.
- [4] **Emmanuel Abunike**, Ogbonnaya Okoro and **Innocent Davidson**, "Thermal Analysis of an Optimized Switched Reluctance Motor for Enhanced Performance". Paper accepted and to appear, in *Proceedings 2021 IEEE PES/IAS Power Africa Virtual Conference*, 23 – 27 August 2021
- [5] **Patrobers Simiyu** and **Innocent Davidson**, "Modeling and Simulation of MVDC Traction Power System for High-Speed Rail Transportation". Paper accepted and to appear, in *Proceedings 2021 IEEE PES/IAS Power Africa Virtual Conference*, 23 – 27 August 2021.
- [6] Njoke L Mbanda, **Patrobers Simiyu**, Zhongqun Wu and **Innocent Davidson**, "Tracking the Progress of Universal Access to Electricity in Africa: Status quo, Challenges and Opportunities". Paper accepted and to appear, in *Proceedings 2021 IEEE PES/IAS Power Africa Virtual Conference*, 23 – 27 August 2021.
- [7] **Nicky Mbaimbai** and **Innocent Davidson**, "Feasibility of Offshore Wind Power for Namibia". Paper accepted and to appear, in *Proceedings 2021 IEEE PES/IAS Power Africa Virtual Conference*, 23 – 27 August 2021.
- [8] **Elutunji Buraimoh**, **Innocent Davidson** and **Patrobers Simiyu**, "Simplified LCL Filter State Space Modeling and Small Signal Stability Analysis of Inverter Based Microgrid". Paper accepted and to appear, in *Proceedings 2021 IEEE PES/IAS Power Africa Virtual Conference*, 23 – 27 August 2021.
- [9] **Surprise Bongani Mthiyane**, **Elutunji Buraimoh** and **Innocent E Davidson**, "Investigation of Fault Ride Through Capabilities of DFIG and PMSG Wind System". Paper accepted and to appear, in *Proceedings 2021 IEEE PES/IAS Power Africa Virtual Conference*, 23 – 27 August 2021.
- [10] **Anyanime Umoette**, Ogbonnaya Okoro and **Innocent Davidson**, "Implementation of Indirect Field Oriented Control of a 2.2kW Three-Phase Induction Motor Using MATLAB Simulink". Paper accepted and to appear, in *Proceedings of IEEE AFRICON 2021 Conference*, Arusha, Tanzania, 13-15 September.
- [11] **Chiweta Abunike**, Ogbonnaya Okoro and **Innocent Davidson**, "Finite Element Design and Multi-objective

Optimization of Four Pole Reluctance Motor Based on NSGA-II Intelligent Algorithm". Paper accepted and to appear, in *Proceedings of IEEE AFRICON 2021 Conference*, Arusha, Tanzania, 13-15 September.

- [12] **Ramesh Kumar Behara, Evans Eshiemogie Ojo and Timothy Kayode Akindeji**, "The Experimental Study on the Impacts of the Integration of DFIG Connected Wind Turbine into Distribution Grid". Paper accepted and to appear, in *Proceedings of IEEE AFRICON 2021 Conference*, Arusha, Tanzania, 13-15 September.
- [13] Adeniyi Onaolapo, Rudiren Pillay Carpanen, David George Dorrell and **Evans Eshiemogie Ojo**, "Forecasting Electricity Outage in KZN, South Africa using Trend Projection and Artificial Neural Networks Techniques". Paper accepted and to appear, in *Proceedings of IEEE AFRICON 2021 Conference*, Arusha, Tanzania, 13-15 September.
- [14] Anuoluwapo Aluko, Rudiren Pillay Carpanen, David Dorrell and **Evans Eshiemogie Ojo**, "Real-Time Dynamic Disturbance Estimation of Stand-Alone Microgrids Based on Unknown Input Observer for Frequency Regulation", Paper accepted and to appear in the *Proceedings of IEEE AFRICON 2021 Conference*, Arusha, Tanzania, 13-15 September.
- [15] **Musawenkosi Lethumcebo Thanduxolo Zulu, Evans Eshiemogie Ojo** and Ajibola Akinrinde, "The Modelling and Simulation Of Power Flow and Fault Analysis For A Hybrid DC Microgrid". Paper accepted and to appear, in *Proceedings of IEEE AFRICON 2021 Conference*, Arusha, Tanzania, 13-15 September
- [16] Avinash Panwar, Vinesh Agarwal and **Gulshan Sharma**, "Frequency Control Studies of Hydro System Using AI Applications". Paper accepted and to appear, in *Proceedings of icABCD Conference*, Durban, Aug 2021
- [17] Avinash Panwar, Vinesh Agarwal and **Gulshan Sharma**, "Studies on Frequency Regulation of Hydro System via New JAYA Optimised LQR Design. Paper accepted and to appear, in *Proceedings of icABCD Conference*, Durban, Aug 2021

Events and Announcements	Upcoming Conferences
Departmental Research Committee (DRC) 30 July 2021 03 September 2021	9th AFRICON conference, 13-15 September 2021, Arusha, Tanzania <i>(Early registration notification, camera-ready papers)</i>
Faculty Research Committee (FRC) 19 July 2021 16 August 2021	IEEE PES & IAS Power Africa Conference, 23-27 August 2021 <i>(Early-Bird registration – 23 July 2021)</i>
ESCA Accreditation 12 July 2021 – 16 July 2021	NEIS Conference, 13 – 14 September 2021, Hamburg-Schmidt-University, Germany 3 rd International Multidisciplinary Information Technology and Engineering Conference (IMITEC) 2021 <i>(Paper Submission – 31 July 2021)</i>

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