

The SAUPEC conference is intended to offer especially postgraduate students, but also other delegates from Southern African Universities and industry, a supportive yet critical platform on which to present quality papers on their research.

SAUPEC papers fall into one of two categories:

- (i) Conference Papers and
- (ii) Discussion Papers.

Conference papers are those that have successfully been through a process of rigorous peer-review and subsequently appear in the published Conference Proceedings.

Discussion papers are not peer-reviewed and therefore do not appear in the published Conference Proceedings. Discussion Papers are, however, included on the SAUPEC 2008 CD-ROM. The decision to introduce the Discussion Paper category was taken at the SAUPEC National Council meeting in 2006 in order give the authors of less formal papers an opportunity to present their ideas and have their work discussed at the conference.









High Voltage & EMC

Machines / Machines & Drives

Power Electronics

Power System Dynamics

Power Systems / Power System Operations

DSM, Economics, Renewable Energy

Measurements / Measurement Systems

**Discussion Papers** 







|   | High Voltage & EMC  |
|---|---|
| T S Dumakude and<br>N M Ijumba  | Study Of Voltage Distribution Along Mixed Insulator Strings   |
| H C Reader, R H Geschke,<br>A J Otto, and J Badenhorst                      | Transfer Impedance And EM Bandgap Structures In EMI Suppression   |
| S K Shifidi, P J Pieterse and H J Vermeulen                                 | Modelling Of A High Voltage Impulse Test<br>Generator With HVDC Bias  |
| G Heger, H J Vermeulen,<br>P Pieterse, J P<br>Holtzhausen and W L<br>Vosloo | Comparison Of Standardized Test Methods For The Incline Plane Test For Insulator Materials                          |
| B S Limbo, H J Vermeulen,<br>W L Vosloo, P Pieterse and<br>J P Holtzhausen  | Aging Test Of RTV SR Coated Glass Insulator Using Tracking Wheel Tester   |
| N U Hlalele, M M Mampane<br>and C Nyamupangedengu                           | Electrical Tree Initiation In Solid Dielectric<br>Medium Voltage Insulation   |
| I Djurdjevic, N J West and<br>I R Jandrell                                  | Preliminary Investigation Into The Performance<br>Of A Quasi-Hemispherical Air Termination Versus<br>A Franklin Rod |





| Machines / Machines & Drives       |   |
|------------------------------------|---|
| M J Kamper                         | Analysis And Winding Design Of Linear<br>Permanent Magnet Machine With Overlap Air-<br>Cored Windings   |
| T Lorimer                          | Mechanical Design Of A Power Line Inspection Robot  |
| E C Lemmer and M J<br>Kamper       | Wind-Electric Pump System Modelling And<br>Evaluation   |
| A Harcharan and G Diana            | Development Of A Scaled Down Laboratory Test<br>Bed System For Use In The Optimisation Of An<br>Underground Fan Driven Air Ventilation System |
| G Mwaba, M A Khan, and<br>P Pillay | Modeling Of A Radial Flux Halbach Array Machine<br>For High Speed Flywheels   |





|  | Power Electronics  |
|--|--|
| I M Salagae, H du T<br>Mouton, and R H Wilkinson | Cell Capacitor Voltage Balancing Of 2-Cell 3-<br>Phase Multicell Inverter  |
| F Koeslag, H du T Mouton<br>and H J Beukes       | The Isolated Effect Of Finite Non-Linear<br>Switching Transitions On Harmonic Distortion In<br>A Class D Audio Amplifier   |
| J-C Malengret                                    | HSVB-PWM For A 3-Phase Z-Source Inverter   |
| Power System Dynamics                            |  |
| R Pillay Carpanen and<br>B S Rigby               | Isolating The Influences Of An SSSC And Its Power Flow Controller On Torsional Interaction                                 |
| R Tiako and K A Folly                            | Optimization Of Power System Stabilizer (PSS)<br>Parameters Using Eigenvalue Sensitivity And<br>Multipower Flow Conditions |
| R van Heerden, N M<br>Ijumba and R Zivanovic     | Reclosing On The Alpha-Beta 765 kV Line  |





| Power Systems / Power System Operations  |  |
|--|--|
| J Smith, W C Stemmet and G Atkinson-Hope | Modeling And Simulation Of Integrated HVAC And HVDC Lines In A Power System                                    |
| M C Leoaneka and B S<br>Rigby            | Investigation Into Under-Reaching Of Distance<br>Relays In Heavily Series Compensated<br>Transmission Networks |
| A A Yusuff, AA Jimoh and<br>J L Munda    | A Generalized Three Phase Fault Location And<br>Analysis In A Two Terminal Fed Power<br>Transmission Line      |
| DSM, Economics, Renewable Energy         |  |
| A C J Lombard and<br>M J Kamper          | Environmental Legislation, Design And Economic<br>Study Of Grid-Connected Micro Hydro Power<br>Systems         |
| A Jakoef, H J Vermeulen and M Bekker     | Compact Fluorescent Lamp (CFL) Voltage Dependancy Test   |





| Measurements / Measurement Systems                       |  |
|--|--|
| J P Criticos, B W D Berry<br>and K J Nixon               | Investigation Into Data Communications Using 230 V / 50 Hz Low Voltage Installations |
| M D Grant, I P Kruger and K J Nixon                      | An Alternate Method Of Power Factor Calculation For IEC 60947-2 Testing              |
| S J Middleton, D J Walters,<br>B M Lacquet and A A Elvin | Wireless Transmitter Micro-Sensor With Energy<br>Scavenger                           |





| Discussion Papers  |   |
|--|---|
| R Okou, A B Sebitosi, M A<br>Khan and P Pillay           | A Case For Electromechanical Energy Storage   |
| L M Masisi, M L Magagula,<br>I W Hofsajer and W A Cronje | Intelligent Multi DC-Level Supplies And Loads: Digitally Controlled Power Supply And Transmission Channel         |
| H M Langa and M J Case                                   | The Design Of A Fault-Free Commutation Control Circuit For A Matrix Converter                                     |
| M Khomari and K A Folly                                  | Impact Of Wind Generators And Network Modification On The Transient Stability Of A Power System Network           |
| N N Moratho  | Voltage Control And Regulation On The Kelvin / Cleveland / Prospect 88 kV Transmission Network                    |
| R H Krusekopf, N Ijumba and<br>M Khan                    | Containerized Control Rooms For Use At Distribution Substations   |
| T T Madangombe, K A Folly, A<br>B Sebitosi and P Pillay  | Issues Related To The Integration Of Renewable Generation Into The Grid   |
| J Yan and T Ngcengeni                                    | Simulations On Strategic Market Behaviors In A Forecasted South African Electricity Market                        |
| I Bisanabo   | Parameter Estimation Of A Permanent Split-Capacitor Single-Phase Induction Motor At Standstill                    |
| BR Duncan and J M Van Coller                             | Investigation Into The Development Of Standing Waves On Long Overhead HVDC Transmission Lines                     |
| B Nyembe, W A Cronje and J Khosa                         | Mechanical And Electrical Condition Assessment Of Power<br>Transformer Windings Using Frequency Response Analysis |







| Atkinson-Hope, G |
|------------------|
| Badenhorst, J    |
| Bekker, M        |
| Berry, BWD       |
| Beukes, HJ       |

| , _          |
|--------------|
| Case, MJ     |
| Criticos, JP |
| Cronje, WA   |
| Diana, G     |

Bisanabo, I

| Djurdjevic, I |
|---------------|
| Dumakude, TS  |
| Duncan, BR    |

| Elvin, AA  |    |
|------------|----|
| Folly, KA  |    |
| Geschke, F | ۲ŀ |

| Grant, MD       |
|-----------------|
| Harcharan, A    |
| Heger, G        |
| Hlalele, NU     |
| Hofsajer, IW    |
| Holtzhausen, JP |
| Ijumba, NM      |
| Jakoef, A       |
| Jandrell, IR    |
| Jimoh, AA       |
| Kamper, MJ      |
| Khan, M         |
| Khan, MA        |
| Khomari, M      |
| Khosa, J        |
| Koeslag, F      |

| Kruger, IP     |
|----------------|
| Krusekopf, RH  |
| acquet, BM     |
| anga, HM       |
| emmer, EC      |
| eoaneka, MC    |
| imbo, BS       |
| ombard, ACJ    |
| orimer, T      |
| ladangombe, TT |
| lagagula, ML   |
| Malengret, J-C |
| lampane, MM    |
| Masisi, LM     |
| Middleton, SJ  |
| Moratho, NN    |
|                |

| Mouton, H du T     | Shifidi, SK    |
|--------------------|----------------|
| Munda, JL          | Smith, J       |
| Mwaba, G           | Stemmet, WC    |
| Ngcengeni, T       | Tiako, R       |
| Nixon, KJ          | Van Coller, JM |
| Nyamupangedengu, C | van Heerden, R |
| Nyembe, B          | Vermeulen, HJ  |
| Okou, R            | Vosloo, WL     |
| Otto, AJ           | Walters, DJ    |
| Pieterse, P        | West, NJ       |
| Pillay Carpanen, R | Wilkinson, RH  |
| Pillay, P          | Yan, J         |
| Reader, HC         | Yusuff, AA     |
| Rigby, BS          | Zivanovic, R   |
| Salagae, IM        |                |
| Sebitosi, AB       |                |
|                    |                |





| Cronje, WA      | Mechanical And Electrical Condition Assessment Of Power<br>Transformer Windings Using Frequency Response Analysis    |
|-----------------|--|
| Cronje, WA      | Intelligent Multi DC-Level Supplies And Loads: Digitally Controlled Power Supply And Transmission Channel            |
| Folly, KA       | Optimization Of Power System Stabilizer (PSS) Parameters Using Eigenvalue Sensitivity And Multipower Flow Conditions |
| Folly, KA       | Impact Of Wind Generators And Network Modification On The Transient Stability Of A Power System Network              |
| Folly, KA       | Issues Related To The Integration Of Renewable Generation Into The Grid  |
| Holtzhausen, JP | Comparison Of Standardized Test Methods For The Incline Plane Test For Insulator Materials                           |
| Holtzhausen, JP | Aging Test Of RTV SR Coated Glass Insulator Using Tracking Wheel Tester  |
| Ijumba, N       | Containerized Control Rooms For Use At Distribution Substations  |
| Ijumba, NM      | Study Of Voltage Distribution Along Mixed Insulator Strings  |
| Ijumba, NM      | Reclosing On The Alpha-Beta 765 kV Line  |







| Kamper, MJ     | Analysis And Winding Design Of Linear Permanent Magnet Machine With Overlap Air-Cored Windings                     |
|----------------|--|
| Kamper, MJ     | Wind-Electric Pump System Modelling And Evaluation   |
| Kamper, MJ     | Environmental Legislation, Design And Economic Study Of Grid-<br>Connected Micro Hydro Power Systems               |
| Khan, MA       | Modelling Of A Radial Flux Halbach Array Machine For High Speed Flywheels  |
| Khan, MA       | A Case For Electromechanical Energy Storage  |
| Mouton, H du T | Cell Capacitor Voltage Balancing Of 2-Cell 3-Phase Multicell Inverter  |
| Mouton, H du T | The Isolated Effect Of Finite Non-Linear Switching Transitions On Harmonic Distortion In A Class D Audio Amplifier |
| Nixon, KJ      | Investigation Into Data Communications Using 230 V / 50 Hz Low Voltage Installations                               |
| Nixon, KJ      | An Alternate Method Of Power Factor Calculation For IEC 60947-2<br>Testing   |







| Pieterse, P  | Comparison Of Standardized Test Methods For The Incline Plane Test For Insulator Materials               |
|--------------|--|
| Pieterse, P  | Aging Test Of RTV SR Coated Glass Insulator Using Tracking Wheel Tester                                  |
| Pieterse, P  | Modelling Of A High Voltage Impulse Test Generator With HVDC Bias  |
| Pillay, P    | Modelling Of A Radial Flux Halbach Array Machine For High Speed Flywheels                                |
| Pillay, P    | A Case For Electromechanical Energy Storage  |
| Pillay, P    | Issues Related To The Integration Of Renewable Generation Into The Grid                                  |
| Rigby, BS    | Isolating The Influences Of An SSSC And Its Power Flow Controller On Torsional Interaction               |
| Rigby, BS    | Investigation Into Under-Reaching Of Distance Relays In Heavily Series Compensated Transmission Networks |
| Sebitosi, AB | Issues Related To The Integration Of Renewable Generation Into The Grid                                  |
| Sebitosi, AB | A Case For Electromechanical Energy Storage  |







| Vermeulen, HJ | Comparison Of Standardized Test Methods For The Incline Plane Test For Insulator Materials |
|---------------|--|
| Vermeulen, HJ | Aging Test Of RTV SR Coated Glass Insulator Using Tracking Wheel Tester                    |
| Vermeulen, HJ | Compact Fluorescent Lamp (CFL) Voltage Dependency Test                                     |
| Vermeulen, HJ | Modelling Of A High Voltage Impulse Test Generator With HVDC Bias                          |
| Vosloo, WL    | Aging Test Of RTV SR Coated Glass Insulator Using Tracking Wheel Tester                    |
| Vosloo, WL    | Comparison Of Standardized Test Methods For The Incline Plane Test For Insulator Materials |



