



Contribution ID: 285

Type: **Poster Presentation**

## **An evaluation of the Newton-Raphson iteration method in the prediction of leaf temperature**

*Thursday, 28 June 2018 15:00 (2 hours)*

A knowledge of the temperature of leaves is of enormous significance particularly from a plant physiological point of view. A study was conducted under field conditions to evaluate Newton-Raphson iterative method as an alternative approach in the indirect determination of leaf temperature from meteorological data. Three field experiments were performed at two different sites at Cape Peninsula University of Technology (CPUT), Bellville Campus in Cape Town, using three different plants. Leaf temperatures predicted from the iteration method were compared with field measurements of leaf temperatures obtained from a local tree, potted *Strelitzia Nicolai* flower plant and *Agapanthus Praecox*, another flower growing at CPUT nursery complex. The strongest relation, characterized by reasonable precision ( $R^2 = 0.89$ ), high accuracy ( $D = 0.96$ ) and a fairly high value of the confidence index ( $C = 0.91$ ) was obtained when *Agapanthus Praecox* was used, whilst *Strelitzia Nicolai* yielded a poorer relationship ( $R^2 = 0.71$ ;  $D = 0.77$ ;  $C = 0.64$ ). The tree had the worst correlation. Leaf temperature computed by the iteration process showed a tendency of underestimation in all the field experiments.

**Please confirm that you have carefully read the abstract submission instructions under the menu item "Call for Abstracts" (Yes / No)**

Yes

**Consideration for student awards**  
**Choose one option from those below.**  
N/A  
Hons  
MSc  
PhD

N/A

**Supervisor details**  
**If not a student, type N/A.**  
**Student abstract submission requires supervisor permission: please give their name, institution and email address.**

N/A

**Primary author:** Dr KUDINHA, Martin (CPUT)

**Presenter:** Dr KUDINHA, Martin (CPUT)

**Session Classification:** Poster Session 2

**Track Classification:** Track F - Applied Physics