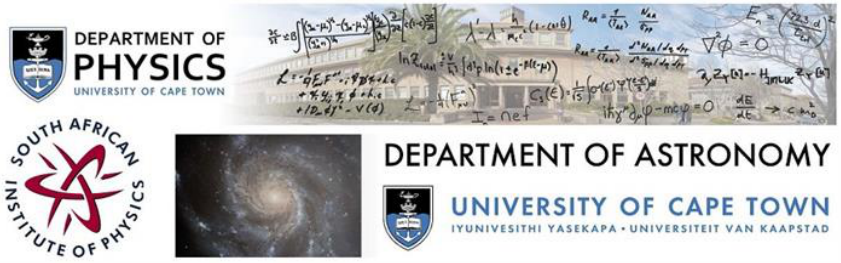

Contribution ID: **184** Type: **Poster Presentation**

Applying the technique of Ultrafast Pump-Probe spectroscopy on the main plant light-harvesting complex of spinach leaves

Wednesday, 6 July 2016 16:10 (1h 50m)

Abstract content
   (Max 300 words)
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The ultrafast transient dynamics of the main plant light-harvesting complex (LHCII) of spinach leaves were studied, using the technique of pump-probe spectroscopy. Explicitly, the excitation energy transfer processes within and amongst the protein-bound pigments (viz. chlorophylls and carotenoids), were investigated. These pigments are responsible for the absorption of solar photons, and transfer the electronic excitation energy on ultrafast timescales to nearby complexes, and eventually to a reaction center where charge separation is induced. Nature is designed in such a way that plants are self-protected against the damage of over-illumination by activating a number of processes which collectively contribute to non-photochemical quenching (NPQ). This poster will outline the information extracted from the South African National Laser Centre (NLC) pump-probe facility, in comparison to the data previously obtained from an ultrafast transient absorption spectroscopy setup at Vilnius University in Lithuania. The wavelengths investigated in both cases were 489 nm and 506 nm, specifically targeting the excited-state dynamics of Lutein1 & Neoxanthin and Lutein2 & Violaxanthin carotenoids, respectively. An intensity dependence study was performed in order to understand possible variations in energy transfer kinetics of the carotenoids and how these changes influence the fast process of NPQ. Global analysis and some target analysis of the transient absorption results were performed using the free Glotaran software.

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Primary authors: Ms SINGH, Asmita (University of Pretoria); Dr KRÜGER, Tjaart (University of Pretoria)

Co-author: Dr VENGRIS, Mikas (Vilnius University, Faculty of Physics, Quantum Electronics Department, Sauletekio 9-III, LT10223 Vilnius, Lithuania)

Presenter: Ms SINGH, Asmita (University of Pretoria)

Session Classification: Poster Session (2)

Track Classification: Track C - Photonics