Contribution ID: **390** Type: **Oral Presentation**

Process Optimization Utilizing Adaptive Algorithms in a Closed Loop Feedback System

Wednesday, 11 July 2012 16:50 (20 minutes)

Abstract content
   (Max 300 words)

We present molecular fragment optimization from parent molecules through the use of a combined optical and electronic closed loop feedback system. Shaped pulses are sent through a time-of-flight setup causing pre-ionization followed by fragmentation of parent molecules. Signal strengths for different fragments are evaluated and success in producing different fragments is determined by some target function. By now using an adaptive algorithm new pulse shapes are determined and pulses changed using an acousto-optic programmable dispersive filter to optimize fragment species or ratios between fragments.
In this work we will compare different learning algorithms leading to process optimization as well as show some techniques of speeding up conversion to an optimal solution. We will show that in some cases optimization of a target function will not necessary be caused by a transform limited pulse, but can be some non-trivial solution. This implies the process is not directly correlated to the pulse energy density, but rather some other criteria. Future experiments will also be discussed which can lead to bond forming between different species as well as experimental processes occurring without the use of pre-ionization.

Apply to be
 consider for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD)?

PhD

Main supervisor (name and email)
and his / her institution

Dr A. du Plessis,anton2@sun.ac.za
University of Stellenbosch

Would you like to <br> submit a short paper <br> for the Conference
 Proceedings (Yes / No)?

no

Primary author: Mr HENDRIKS, Attie (SAIP member)

Co-authors: Dr STEENKAMP, Christene (Stellenbosch University); Dr UYS, Hermann (CSIR-NLC); Dr BOTHA, Lourens (CSIR-NLC)

Presenter: Mr HENDRIKS, Attie (SAIP member)

Session Classification: Photonics

Track Classification: Track C - Photonics