

**AOFSRR 2015**

Asia Oceania Forum for Synchrotron  
Radiation Research



in conjunction with

**USER  
MEETING  
2015**

National Centre for Synchrotron Science

25-27 NOVEMBER 2015

Contribution ID : 106

Type : **Oral**

## LASER PHOTOLYSIS ON THE THZ BEAMLINE AT THE AUSTRALIAN SYNCHROTRON

*Friday, 27 November 2015 14:35 (20)*

Laser photolysis is a new capability that is presently being added to the THz/Far-IR beamline. This technique will allow our users to perform pioneering spectroscopic studies at ultra-high spectral resolution on gaseous molecules of astrophysical interest; it will also enable our users to study photochemical changes in condensed-phase, solid and biological systems after or during laser irradiation.[1][2]

The addition of lasers will also allow a host of sunlight driven reactions to be studied, providing a source of radicals such as OH or halogens.[3]

We currently have two lasers: A 40 W cw CO<sub>2</sub> laser from Monash University, operating at 10.6  $\mu\text{m}$ , and a 10 Hz pulsed 480 mJ Nd:Yag Surelite Continuum laser from La Trobe University, operating at 1064, 532, 355 and 266 nm

A photolysis gas cell is also available for use. It is suitable for creating steady-state chemical populations with the laser, which can then be probed by the Synchrotron source. We are the only THz beamline with these capabilities.

### REFERENCES

- [1] J Nishii et al, "Photochemical reactions in GeO<sub>2</sub>-SiO<sub>2</sub> glasses induced by ultraviolet irradiation: Comparison between Hg lamp and excimer laser" *Physical Review B* 52.3 (1995): 1661.
- [2] Kaiser, Ralf I., et al. "Untangling the chemical evolution of Titan's atmosphere and surface—from homogeneous to heterogeneous chemistry." *Faraday discussions* 147 (2010): 429-478.
- [3] W.J.R. French, "Hydroxyl Airglow Temperatures above Davis Station, Antarctica", University of Tasmania, Australian Antarctic Division (2002)

### Keywords

**Primary author(s)** : PLATHE, Ruth (Australian Synchrotron)

**Co-author(s)** : Dr APPADOO, Dominique (The Australian Synchrotron)

**Presenter(s)** : PLATHE, Ruth (Australian Synchrotron)

**Session Classification** : Beamline updates

**Track Classification** : Beamlines, Instrumentation and Techniques