

## ABSTRACT

In order to provide insight into the spatial and temporal evolution of atomic and ionic species in a laser produced plasma plume, a detailed study has been undertaken of the time- and space-resolved photoabsorption measurements of magnesium, aluminium and silicon plasmas. The measurements were made using dual laser plasma experiments and the spectroscopic data was obtained by employing a multilaser multichannel spectrometer at the Laser Plasma Research Centre, School of Physical Sciences, Dublin City University, Ireland. In dual laser plasma technique two time synchronized plasmas are used. One plasma acts a source of absorbing species and the other provides continuum radiation.

The results of the time- and space-resolved photoabsorption measurements are exhibited . The dynamics of the atomic and ionic species in the laser plasma plume is discussed. The suitability of the time and space photoabsorption spectroscopy of laser produced plasmas for doing absorption spectroscopy of free atoms and ions of interest in ground and excited states is described.