A novel approach in scramjet propulsion research, in two-dimensional planar configurations, is the injection of fuel on the inlet coupled with a concept known as radical farming. Together they promise structurally lighter combustion chambers that have less drag and produce higher thrust than conventional uniform flow scramjets. However, practical scramjet configurations are moving away from two-dimensional planar configurations as thermal, structural and efficiency gains can be realised.

In his presentation, Dillon will present the application of inlet injection and radical farming to an axisymmetric Busemann-like configuration. Experimental results demonstrating significant combustion at zero degrees angle of attack and limits of operation in terms of dynamic pressure, angle of attack and fuel/air equivalence ratio will be shown.

Three-dimensional, finite-rate combustion computational fluid dynamics are in good agreement with the experimental results providing confidence in the simulations. These simulations were examined, and the results will be presented providing insight into the flow path processes.

Dillon is a part-time PhD student under the supervision of Dr Russell Boyce, Prof. Michael Smart and Dr Vincent Wheatley. He obtained his Bachelor of Mechanical and Master of Aerospace Engineering degrees at The University of Queensland. Dillon has twelve years of experience in supersonic and hypersonic research, development and flight testing.

When
Friday, 17 January 2014, 3-4pm
Where
49-502 Seminar Room
Advanced Engineering Building
School of Mechanical and Mining Engineering