



Australian Government
Department of Defence
 Science and Technology

Hypersonics research

The Defence Science and Technology (DST) Group is the lead Australian research agency undertaking advanced research into hypersonic technologies to enable sustained high-speed flight in the atmosphere.

Hypersonics, the study of velocities greater than five times the speed of sound, or Mach 5.0, is expected to offer significant advantages for both defence and civilian aerospace applications.

HIFiRE

DST has been working with the US Air Force Research Laboratory (AFRL) since 2006, investigating fundamental hypersonic technologies as part of the Hypersonic International Flight Research Experimentation (HIFiRE) program. Worth more than \$70 million, this program has focussed on developing and validating technologies to enable sustained hypersonic flight within the atmosphere.

The program has involved ground testing, modelling and simulation, and up to nine flight tests to collect aerothermodynamic, propulsion and combustion data. DST is working with the University of Queensland and industry partners to develop a ground-based test and evaluation capability to certify the air vehicle structure, systems and flight software.

Latest developments

In 2017, the team will conduct a controlled experiment that will see two gliders launched using a two stage solid fuelled rocket motor on a ballistic trajectory, reaching a maximum altitude of 190km. On re-entry into the atmosphere, aerodynamic control surfaces will be used to pull the gliders out of a Mach 6 dive, to horizontal flight.

The knowledge gained from these flight trials will be applied to the development of future hypersonic flight vehicles which will use advanced air-breathing hypersonic propulsion engines, known as supersonic combustion ramjets (scramjets). Scramjet technology offers the exciting possibility of ultra-high speeds and significant fuel efficiencies that could lower the cost, not only of intercontinental travel, but of access to space.



For further information:

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