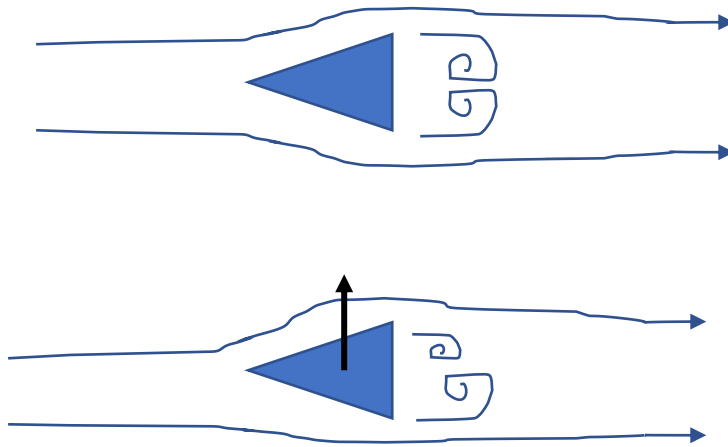


Main Mixing System Experiments

Flow around stationary and moving wedges



1. Rational

To establish if the flow around stationary and moving wedges agrees with the general pattern described in our papers and, more importantly, complies with the requirements of the system – that is: that there is a suitable “dead-space” behind the wedge into which the fuel may be deposited.

2. Setup

The wedge could be moved through a fixed flow, or the flow moved over a stationary wedge.

3. Instrumentation methods

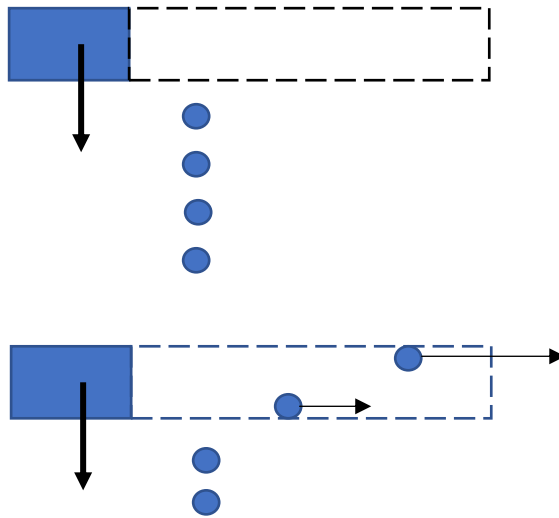
Flow patterns should be directly visible through a Shadow-graph or Schlieren optical system.

A tracer may also be released in front or behind the wedge (glitter, smoke, etc).

A supersonic pitot tube can measure pressure.

Hot wire anemometry could also be used.

Acceleration of pellets in supersonic flow



1. Rational

To establish if the pellets accelerate when exposed to a supersonic flow in a way which aligns with that predicted in our papers and, again more importantly, is compatible with the system.

2. Setup

Simple nozzle swept across pellets – or pellet attached with poor adhesive which gives way in established flow (or can be introduced into the flow). May be difficult if not sufficient room between Mach diamonds.

3. Instrumentation methods

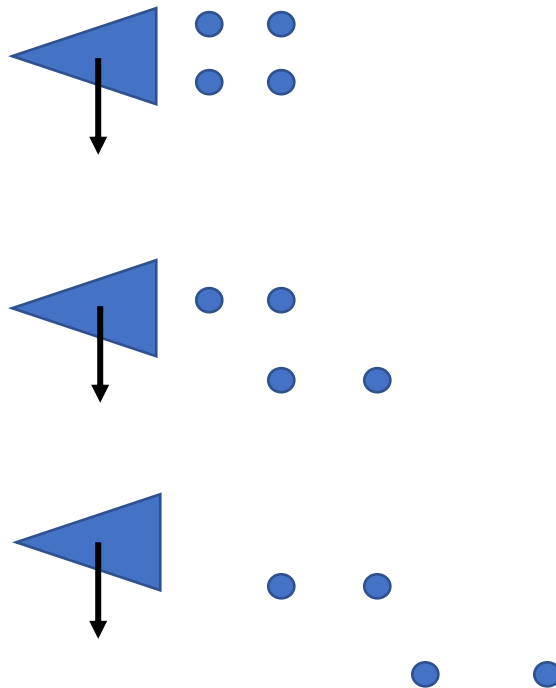
High speed camera system.

Double flash photographic system

light beam triggered as pellet passes.

Ultrasonic doppler

Full experiment



1. Rational

This experiment tests the full system with a single wedge. Pellets deposited behind the wedge should get swept into the flow as the wedge passes.

2. Setup

Pellets may be introduced in a variety of ways – door, funnel, held by magnet. Again, uniform flow needs to be long enough to show effect.

3. Instrumentation methods

As for experiment above (acceleration of pellets).