

Simulation (CFD/FEM)

Experiment

Construction

Theory

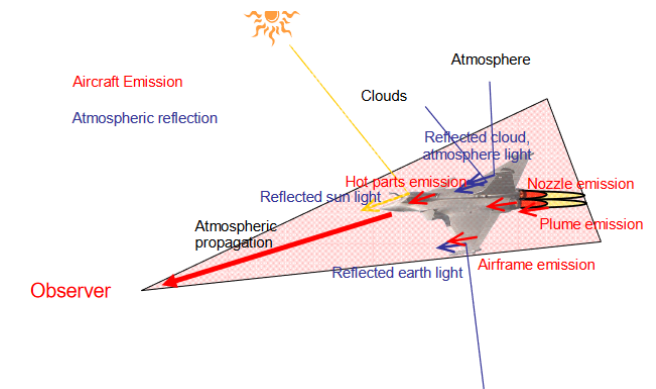
Numerical investigation of the infrared signature of fluidic thrust vector nozzles for UAVs

Overview:

At the Institute of Jet Propulsion (ISA) of the University of the German Armed Forces Munich (UniBwM), novel concepts for thrust-vector manipulation of subsonic aircraft and their integration into the overall system are investigated. Concepts for thrust-vector sweeping can lead to an increase in agility and/or a reduction of the so-called radar cross-section and infrared signature. Within the scope of this work, different thrust vectoring nozzle concepts with rectangular nozzle exit cross-section will be investigated numerically (CFD). A special focus will be put on the effects of the geometrical parameters on the IR-signature.

Objectives:

- Design (analytical), construction (CAD) and detailed numerical investigation (CFD) of a three-dimensional fluidic thrust vectoring nozzle with rectangular outlet cross-section.
- Use of a suitable program to determine the infrared signature of the thrust vector nozzle and its exhaust jet. Variation of geometric parameters and operating points/ambient boundary conditions.
- Elaboration of different parameterized geometries and investigation of the influences of different geometric parameters on the IR signature.



Main contributors to the Infrared Signature of an aircraft, Source: ONERA

Requirements:

- Interest in numerical flow simulation and CAD (ideally, basic theoretical knowledge and first practical experience with flow solvers exist)
- Interest in fluid mechanics + thermodynamics and the application of learned theory
- Independent and target-oriented way of working

Begin: Immediately

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