



## Infrared signature of aircraft

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OKTAL SYNTHETIC ENVIRONMENT (OKTAL-SE) is a French provider of simulation tools that are used to assess the performance of electro-optic (EO) and radar sensors. This workbench is used for instance to compute the infrared signature of aircraft in the frame of detection and tracking studies. This topic is a real challenge as it combines the management of the gaz turbine engine, the thermodynamics of the fluid flow around the aircraft, the computation of the plume radiance and the propagation of this signal in the atmosphere.

Thanks to collaborative work with ESI achieved in 2018, OKTAL-SE proposes a dedicated tool suite that covers the entire simulation workflow of aircraft signature. This package relies mainly on OpenFOAM and the SE-WORKBENCH-EO (OKTAL-SE simulation offer in the EO domain).

The presentation will show the breakdown of the simulation process with the interfaces that have been developed first to initialize the OpenFOAM computation and second to transfer the fluid computation results into the 3D synthetic environment used for infrared rendering computation. The strategy of fluid computation volume and boundary conditions will be illustrated on realistic simulation.

The key advantages of the OpenFOAM approach for this specific application will be pointed out in particular with regards to other CFD computation code previously used by OKTAL-SE customers.