

CFD Analysis of the Effect of Frigate Exhaustions on Helicopter Performances during onboard operations

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ABSTRACT

Helicopter recovery maneuvers on frigates can be a challenge for pilots. The aerodynamic interference between the frigate superstructure and the helicopter results in a complex airflow which causes an increase in the pilot's workload during the operations above the helideck. But the dangers are not just the presence of large areas of turbulent and detached flow. The interaction of the helicopter with the engine exhausts emissions from the frigate can affect pilot visibility and even the aircraft's performance. These high-temperature emissions coming out of the funnel can cause sudden changes in air density, affecting the performance of the aircraft turbine during the final phase of the maneuver.

This paper aims to perform a numerical analysis using Computational Fluid Dynamics (CFD) to quantify the loss of performance that a helicopter may experience operating in the presence of frigate exhaust emissions. The study is performed on a Simplified Frigate Model, under different navigation conditions and different exhaust outlet temperatures.

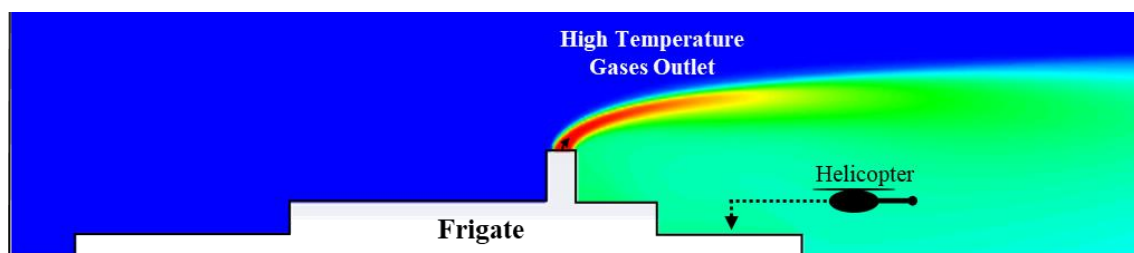


Fig. 1. Scheme of the high temperature gases outlet problem for the helicopter operation.

REFERENCES

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