

Abstract Submitted
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RANS study of flow Characteristics Over flight deck of Simplified frigate Ship SHRISH SHUKLA¹, SIDH NATH SINGH², BALAJI SRINIVASAN³, Indian Institute of Technology Delhi — The combined operation of a ship and helicopter is ubiquitous in every naval organization. The operation of ship with the landing and takeoff of a helicopter over sea results in very complex flow phenomena due to presence of ship air wakes, strong velocity gradients and widely varying turbulence length scales. This complexity of flow is increased with the addition of helicopter downwash during landing and takeoff. The resultant flow is therefore very complicated and accurate prediction represents a computational challenge. We present Reynolds-averaged-Navier-Stokes (RANS) of turbulent flow over a simple frigate ship to gain insight into the flow phenomena over a flight deck. Flow conditions analysis is carried out numerically over the generic simplified frigate ship. Profiles of mean velocity across longitudinal and transverse plane have been analyzed along the ship. Further, we propose some design modifications in order to reduce pilot load and increase the ship helicopter operation limit (SHOL). Computational results for these modified designs are also presented and their efficacy in reducing the turbulence levels and recirculation zone in the ship air wakes is discussed.

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