

Performance Analysis of Novel Surveillance UAV using OpenFOAM

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ABSTRACT

The objective of the present project is to simulate and study the flow around the UAV and also calculate the C_l and C_d values. The geometry is created in Catia V5 and then saved as a .stl file, this file can then be converted and meshed using various tools built into OpenFOAM. "snappyHexMesh" is used to create the mesh for the UAV and blockMeshDict file is used to create the Domain Mesh. Also the patch conditions and other necessary changes to be made to the case are going to be shown in this project. The incompressible solver "simpleFoam" is going to be used to run this simulation. The UAV going to be simulated is shown below in Fig-1 and air properties are shown in Table-1



Fig- 1 UAV model

altitude	Density(kg/m ²)	Viscosity (10 ⁻⁵ N s/m ²)	Temperature (°C)	Pressure (N/m ²)
Sea level	1.225	1.789	25	101250

Table 1 Air properties