AN INVESTIGATION OF THE AERODYNAMIC PARAMETERS FOR SOLAR PLANE WING PROFILE USING CFD MODELLING
HISTORY OF SOLAR PLANES

- SUNRISE 1 (1974)
- SOLAR IMPULSE 1 (2009)
- SOLAR IMPULSE 2 (2011)

CFD STUDIES OF SOLAR PLANES

None of the studies describe the effect of partially flat surfaces in the wings of a solar plane.

LOW AOA – GOOD ACCURACY

THE ACCURACY OF ANSYS FLUENT

CL/CD max FOR AOA = 4°
GEOMETRY

AIRFOIL

AGH

THE FIRST model

AG35

GEOMETRY

6 m

14 m

5 m

7 m
THE FIRST model

AIRFOIL
MESH
THE FIRST
model

y+ > 40
THE FIRST model

SOLAR PLANE
THE SECOND model

CLARK Y

FX60-100

2D AIRFOIL

TWO BASIC MODELS and

4 modifications

partially flat surfaces
THE SECOND model

BASIC MODELS

v = 30 km/h

FX60-100 vs CLARK Y

2D AIRFOIL

\( cL/cD = f(\text{AOA}) \)

v = 40 km/h

v = 50 km/h
THE SECOND model

2D AIRFOIL

LIFT COEFFICIENT = F(AOA)

MODIFICATED MODEL vs BASIC MODEL

DRAG COEFFICIENT = F(AOA)
THE SECOND model

3D AIRFOIL

AERODYNAMIC TUNNEL

ANSYS CFD
THE SECOND model

THE FUSELAGE

OLD version

NEW version
SUMMARIZING A POINT
THANK YOU for YOUR ATTENTION

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