

FLOW AROUND AIRFOIL AND BLUFF BODY

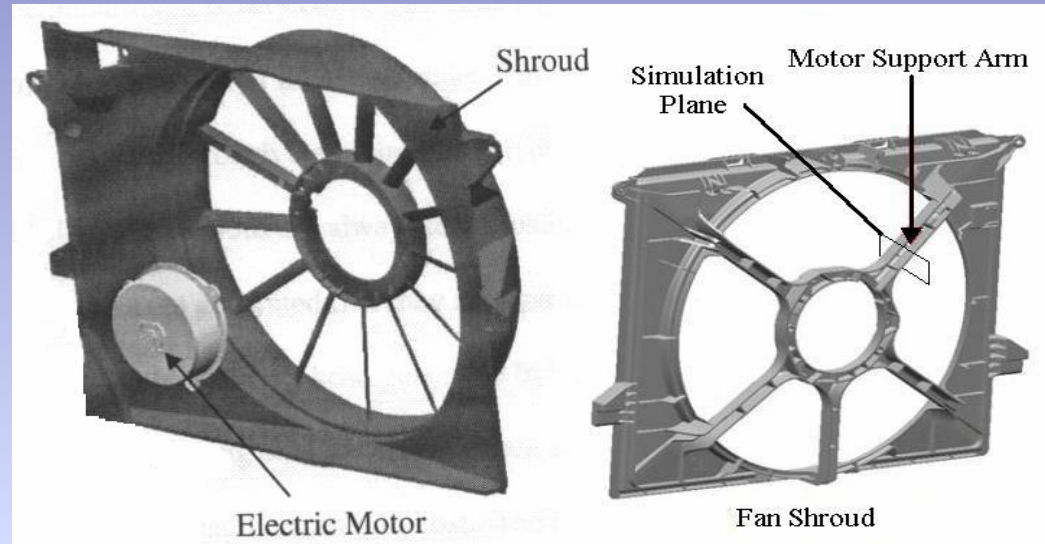
COMPONENTS OF AN AUTOMOTIVE COOLING FAN

Background

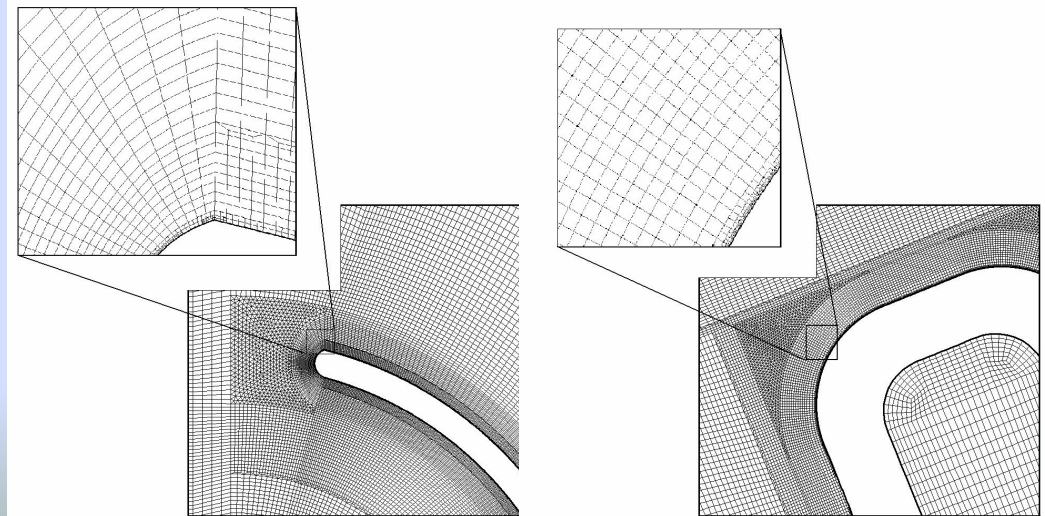
To hold the motor in the centre of the fan shroud, *support arms or stators* can be used. However, they affect the air flow in different ways.

Objective

The aerodynamic performance of support arms and stators in a fan are being investigated numerically using realistic inlet conditions.



Shroud with stator (left) and support arm (right)



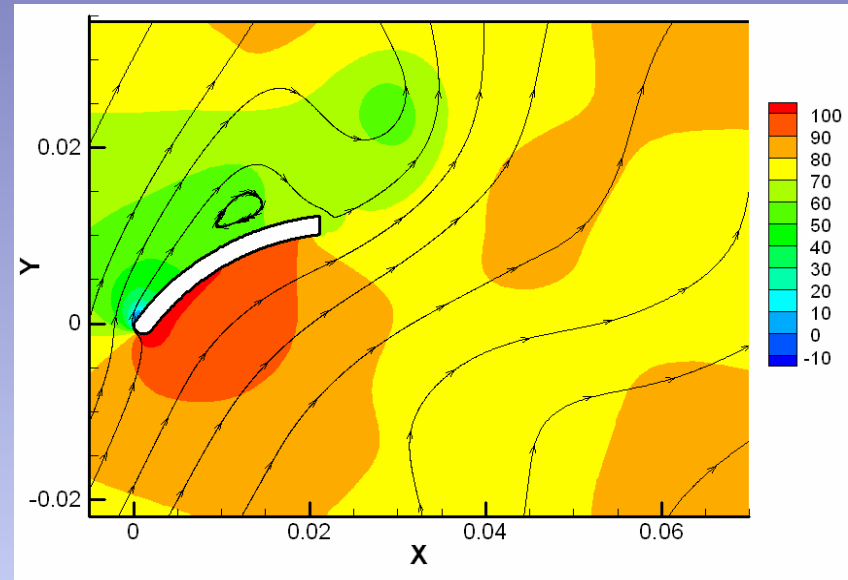
Computational domain mesh of stator (left) and support arm (right)

Research Carried Out

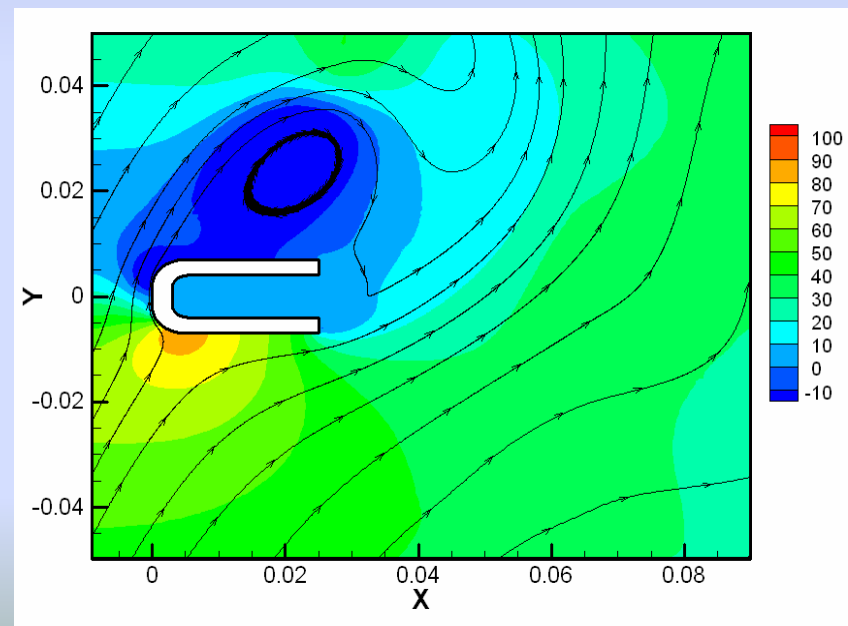
Flow over single and arrays of the stators and support arms were simulated based on the available experimental data.

Key Findings

The interaction among stators significantly reduces the aerodynamic forces acting on a single stator. Negligible interaction effects are reported for the support arm. The potential efficiency gain associated with the use of stators is demonstrated.



Pressure field (Pa) and stream lines for the stator



Pressure field (Pa) and stream lines for the support arm