AEROSPACE VEHICLE DESIGN LABORATORY

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ABOUT LABORATORY

LAB MEMBERS

Post Doc : 1 | Ph.D. Candidate : 8 | Master Course : 9 | Researcher : 1

LAB INFORMATION

Location: Engineering Building 301-1213
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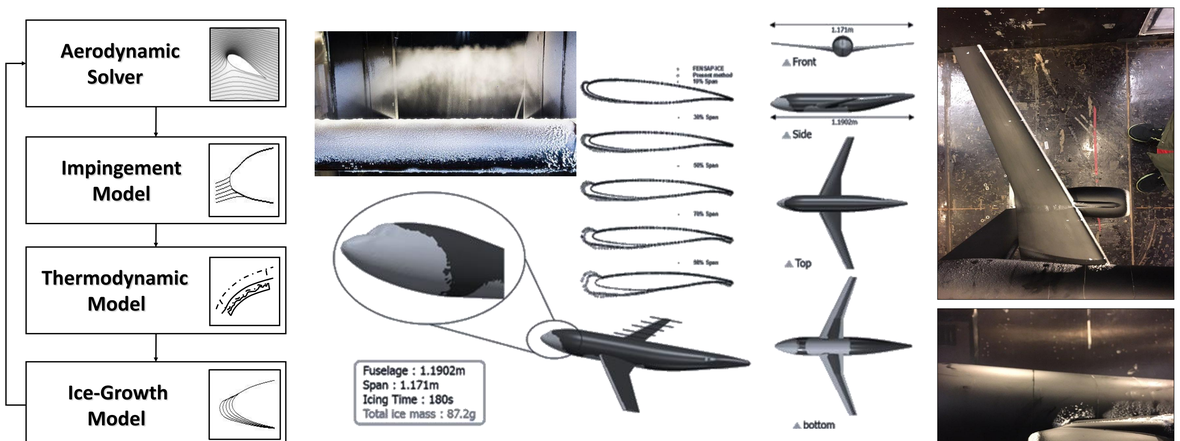
Homepage: avdl.snu.ac.kr

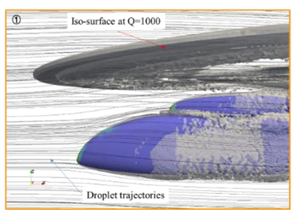
AVIATION SAFETY

ICING PROBLEM

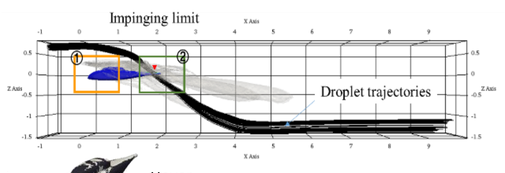
Below freezing temperature, super cooled liquid water droplets freeze on the aircraft surface

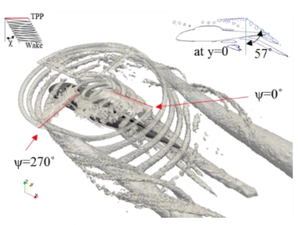


△ Numerical & Experimental Approach

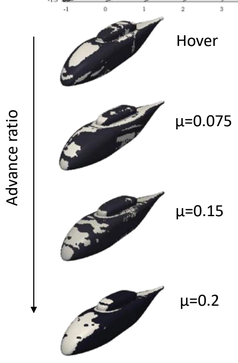


△ Helicopter Fuselage Icing

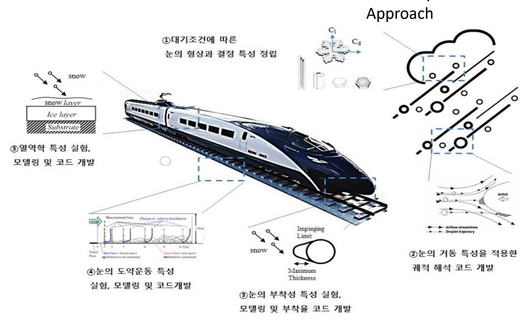




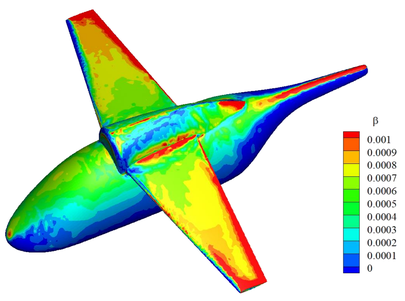
△ Flow filed and droplet trajectories at μ=0.075



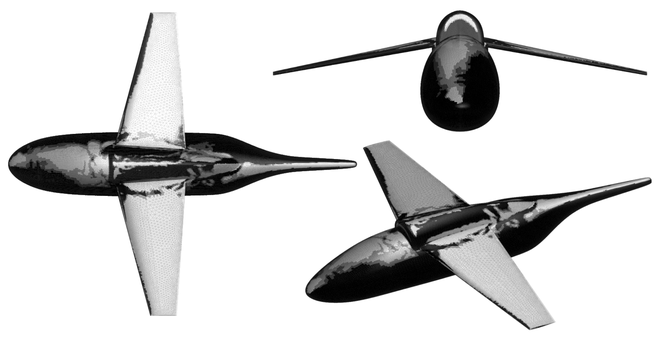
△ Ice accretion shapes with various advance ratio



△ Identification of ice accretion phenomenon and development of numerical simulation methods for high-speed railway vehicle



△ Distribution of supercooled droplets impingement on compound rotorcraft

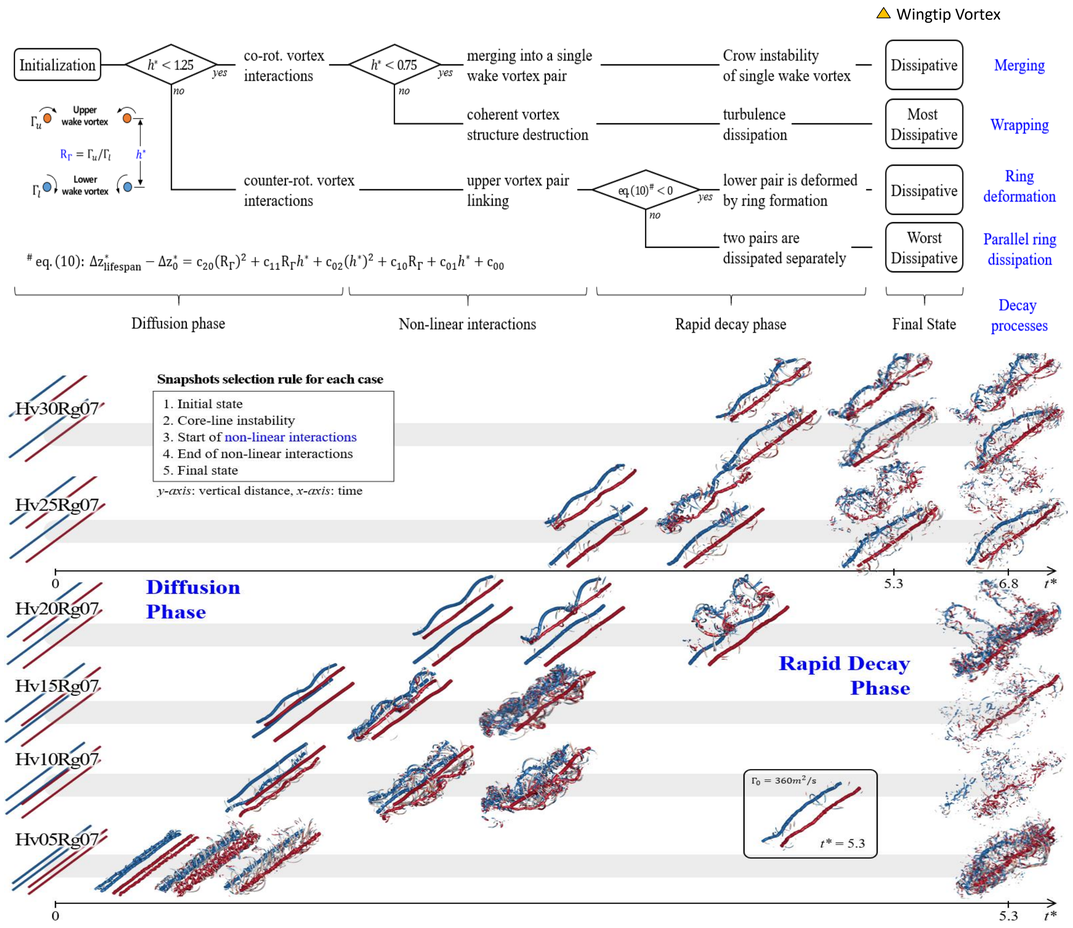


△ Ice accretion shapes on compound rotorcraft

WAKE HAZARD AVOIDANCE

Two pairs of wake vortex interaction study for increasing airport capacity

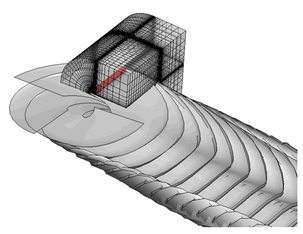
△ Wingtip Vortex



DESIGN OPTIMIZATION

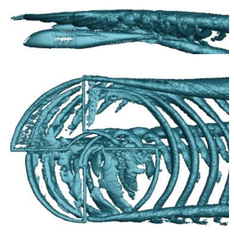
ROTOR AERODYNAMIC ANALYSIS

Estimating helicopter performance requires large computational time, efficient CFD technique is required

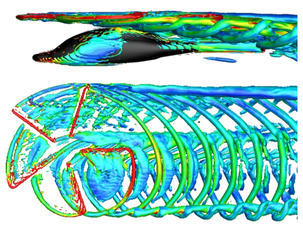


△ Hybrid Method (CFD + Wake Coupling)

△ Actuator Disc Method



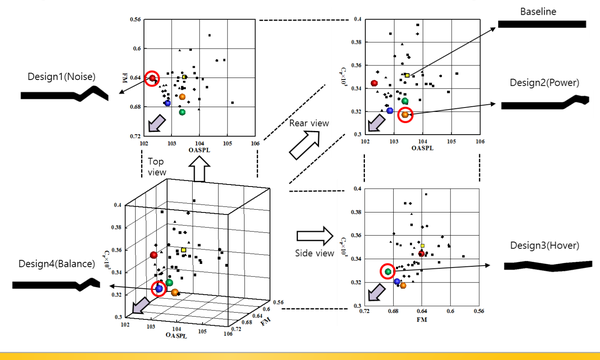
△ Actuator Surface Method

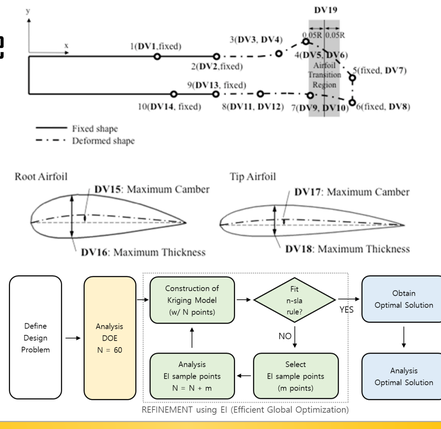


△ Full CFD with structured chimera grid

HELICOPTER ROTOR BLADE

Improvement of Aero-Acoustic performance

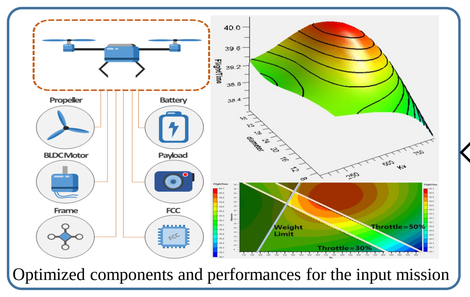


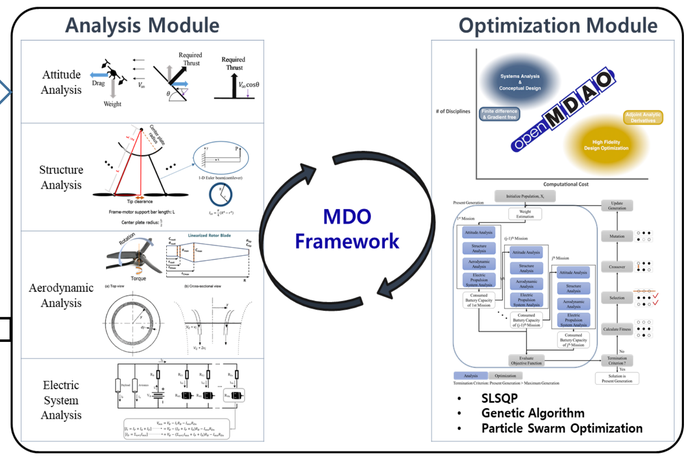


MULTI-DISCIPLINARY ROTORCRAFT DESIGN

PRELIMINARY ROTORCRAFT DESIGN

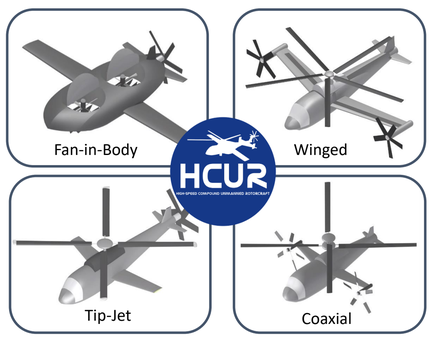
Develop an optimization design framework for the required mission
Design and test safety system of the multirotor for safe operations

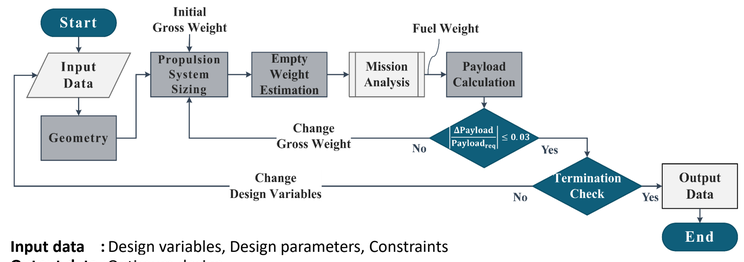




HCUR(HIGH-SPEED COMPOUND UNMANNED ROTORCRAFT)

Conceptual design of compound rotorcraft for future warfare



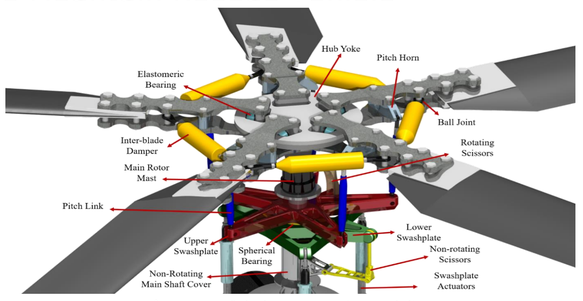


Input data : Design variables, Design parameters, Constraints
Output data : Optimum design

VFS 36TH ANNUAL STUDENT DESIGN COMPETITION (2ND PLACE)

Conceptual design of Extreme Altitude Mountain Rescue Vehicle

△ Mountain rescue vehicle concept 3D rendering



△ Rotorcraft hub structure 3D modeling