中航工业 & 英国大学 校企合作进展

Cooperation Progress Between AVIC & UK Universities

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合作模式
Cooperation Pattern

合作成果
Cooperation Achievement

阶段总结
Phased Summary

中航工业开放式创新的战略举措
Open and Innovative Strategic Moves of AVIC

- 中航工业利用全球资源

  AVIC utilizes global resources

- 构建开放协同创新体系

  Constructs an open collaborative innovation system

- 推进产学研创新合作

  Promotes industry-university research innovative cooperation

- 大力加强基础研究和前沿探索

  Greatly strengthens fundamental research and frontier exploration

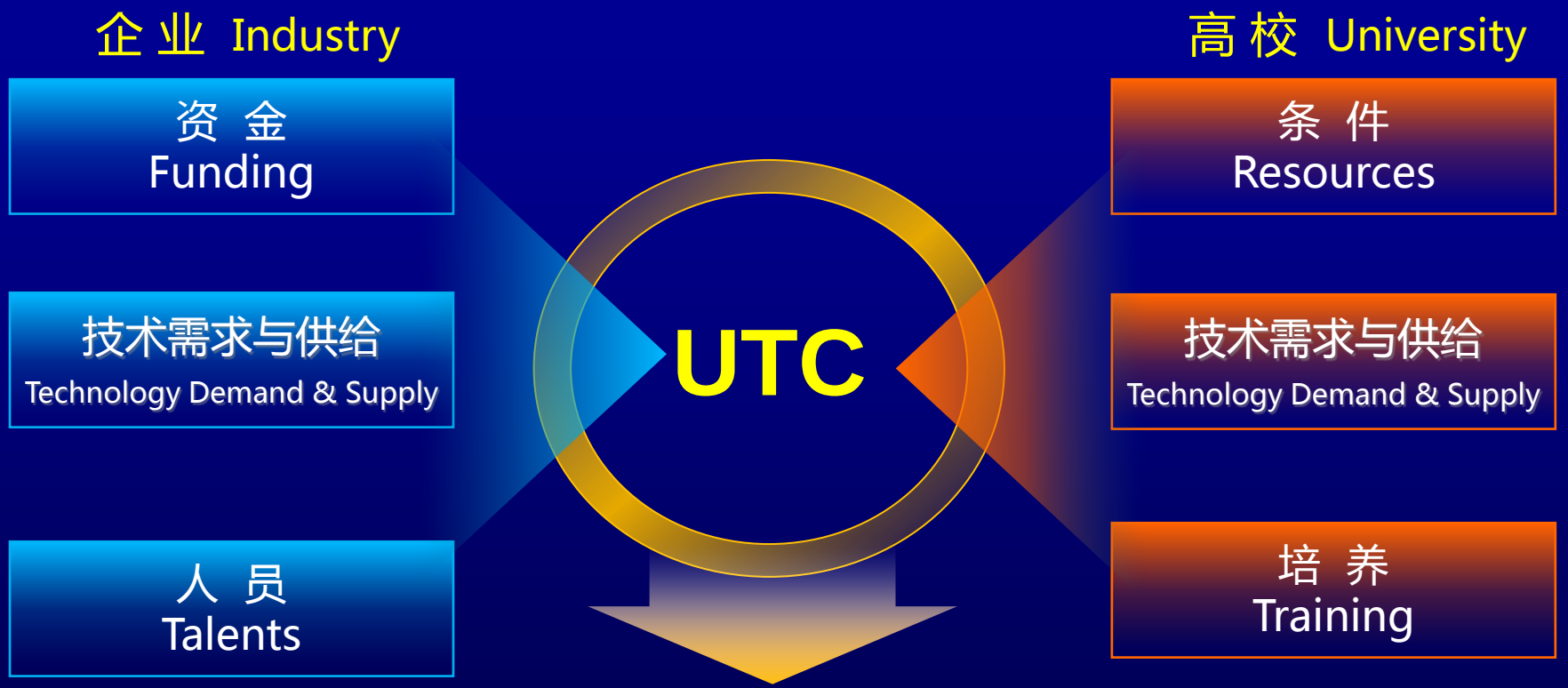
- 国内17家高校、国外5所高校开展战略合作

  Has conducted strategic cooperation with 17 domestic universities and 5 universities overseas

- 英国、法国高校联合培养人才

  Jointly train the talents with UK and French universities

校企合作模式
Pattern of Industry-University Cooperation



成果推广转化平台 Research Results Transfer Platform
吸引企业资金平台 Fund Platform of Attracting Industry
人才培养平台 Talent Training Platform

中航工业英国大学技术中心
AVIC-UTC in UK

- 目 标
  Targets

前沿技术
Frontier technology

基础研究
Fundamental research

培养国际化人才
Train talents with international view

提升创新能力
Improve innovation capability

- 共享成果
  Sharing Achievements

合作模式
Cooperation Patterns

联合研究项目
Joint research projects

访问研究（每年6~8名访问学者）
Visiting research （6~8 visiting scholars per year）

研究生项目
Postgraduate Program

委托项目
Commissioned research projects

管理组织
Management Organization

中航工业英国大学技术中心 AVIC-UTC in UK

序号 No.	国内单位 AVIC Participant	合作单位 UK Participant	中心名称 Name Of Center	中心定位 Center Orientation
1	制造所 BAMTRI 一飞院 The First Aircraft Institute	帝国理工大学 ICL	中航工业结构设计制造中心 AVIC Centre for Structural Design and Manufacture	中航工业结构设计制造中心 AVIC Centre for Structural Design and Manufacture
2	航材院 BIAM	帝国理工大学 ICL	中航工业材料表征、加工及仿真中心 AVIC Center for Material Characterization, Processing and Modeling	无损检测、多尺度仿真和材料表征、结构完整性等领域开展相关研究工作 Relevant researches on the NDT, multi-scale modeling and material characterization, structural integrity
3	航材院 BIAM	曼彻斯特大学 Manchester Univ.	中航工业航空材料大学技术中心 AVIC Center for Aeronautical Materials University Technology	航空材料技术基础研究机前沿探索 Technology fundamental research and frontier exploration of aeronautical materials
4	商发 ACAE	诺丁汉大学 Nottingham Univ.	中航工业航空发动机大学创新中心 AVIC Civil Aero-engine University Innovation Center	商业发动机的研究与创新 Research and innovation of commercial aero-engine

研究生培养 Postgraduate Program

- 中航工业：派遣科技人员

  AVIC: to send scientific and technical talents to study abroad

- 英国高校：定制硕士、博士生团体课程

  UK universities: to provide tailored courses for master and doctorial degree candidates

针对企业需求定制的团队人才培养课程

Tailored Courses in Accordance With Industry Demands

中航工业

研究生培养 Postgraduate Program

克莱菲尔德大学
Cranfield Univ.

诺丁汉大学
Nottingham Univ.

硕士研究生
Master degree candidate

博士研究生
Doctorial degree candidate

亨利商学院 Henley Business School

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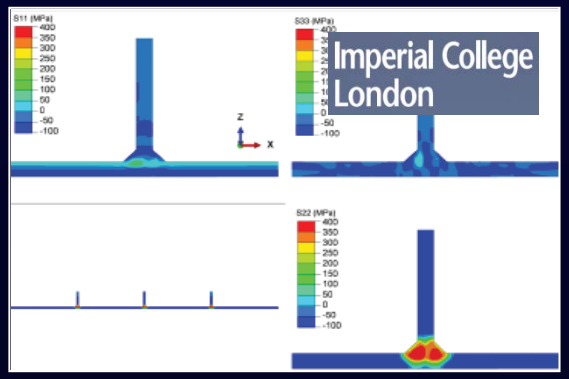
激光焊接接头的性能及失效预测

Properties and Failure Prediction of Laser Welded Joint

民用飞机结构试验件

Civil aircraft structure test piece

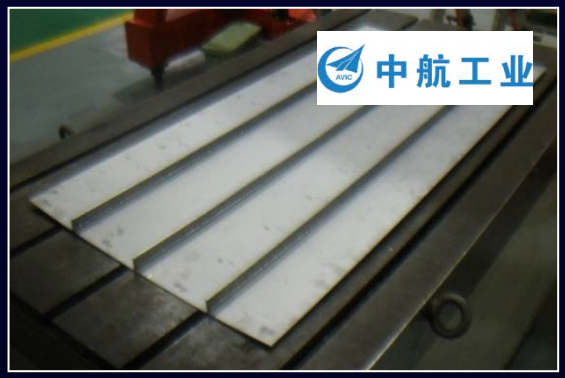


国际领先的基础研究

Word leading fundamental research

2XXX系铝合金结构激光焊接

Structural Laser welding of 2xxx series aluminum alloy

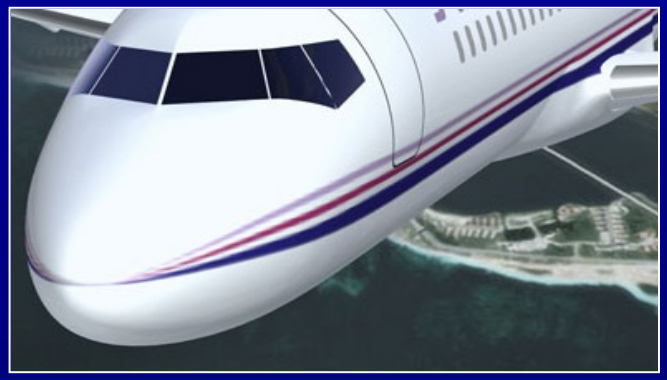


激光焊接应用性研究

Research on the laser welding application

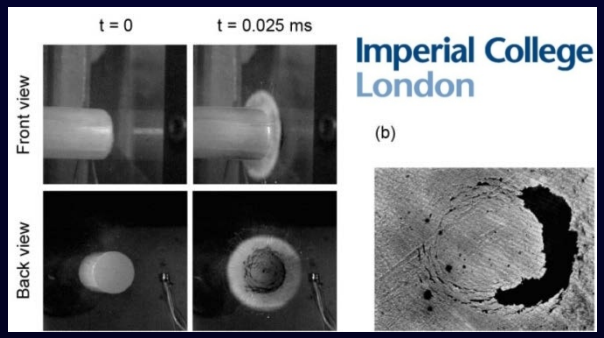
新型航空透明材料基础研究及其应用技术开发

Fundamental Research and Application Technology Development of New Transparent Materials



客机前风挡和舷窗

Windows for aircraft



世界领先的研究及试验方法

World-leading research and experiment methods

针对复合结构透明件的设计

Design for composite structural transparent part

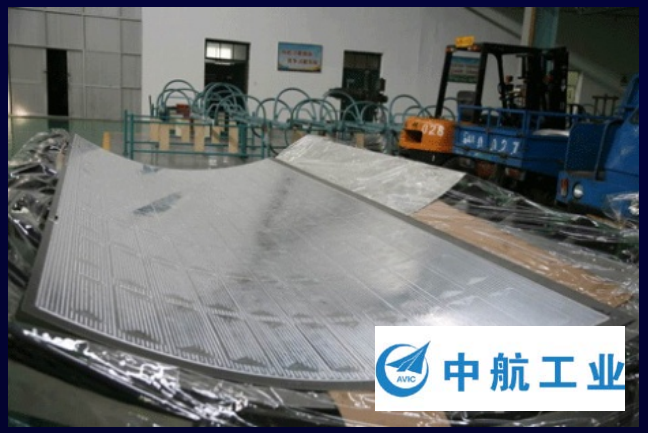
透明材料研发及应用的专业知识

Expertise for R&D and application of transparent material

航空铝锂合金的环保型表面处理技术研究

Research on the Environmental Friendly Surface Treatment Technology of Aeronautical Aluminum-lithium Alloy

世界领先的研究及评价方法
World-leading research and evaluation methods



航空材料研发及应用的专业知识
Expertise for R&D and application of aeronautical materials

发展高效环保的表面处理技术，解决航空用铝锂合金的防腐蚀问题

To develop a high-effective and environmental-friendly surface treatment technology for solving the corrosion problem of aeronautical Al-Li alloy

联合培养研究型人才49名

49 research-oriented talents trained jointly

申请专利2项

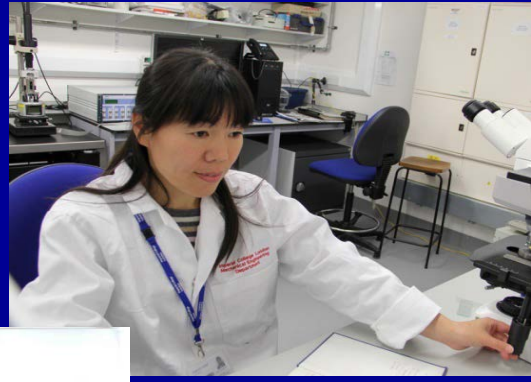
2 patents applied

发表高水平论文60篇

60 high level papers published

经费397万镑

£ 3,970,000 Funded



研究生培养

Postgraduate Program

赴克大和诺大留学人员459名

包括博士12人

已学成回国435人

459 students were sent to Cranfield University and University of Nottingham , including 12 doctors. 435 have finished their study overseas and returned to China.


Certificate Awarding Ceremony for the Fourth Cohort
of AVIC Postgraduates from Stanford University


Certificate Awarding Ceremony for the Sixth Cohort
of AVIC Postgraduates from Cranfield University

各年度各院校派员人数

Number of Students Sent Abroad Per Year

年份 Year	克大 Cranfield Univ.	诺大 Nottingham Univ.
2008年	49	0
2009年	56	0
2010年	58	0
2011年	54	15
2012年	57	9
2013年	36	9
2014年	39	20
2015年	47	10
合计 Total	**396**	**63**

八批学员团队项目研究题目

Research Subjects for the Trainees of 8 Batches

飞机 设计专业 Aircraft Design

批次 Batch	团队项目研究题目 Research subject
第一批 The 1st batch	确定130座级“翔鹤”飞机的总体构型和各项参数，完成概念设计阶段的各项任务 Determine the overall configuration and parameters of 130 seats “SHOKAKU” aircraft, complete each task at the conceptual design stage
第二批 The 2nd batch	完成“翔鹤”飞机的初步设计 Complete the preliminary design of “SHOKAKU” aircraft
第三批 The 3rd batch	完成“翔鹤”飞机的部分详细设计 Complete partial detailed design of “SHOKAKU” aircraft
第四批 The 4th batch	完成一架200座常规布局客机的概念设计 Complete the conceptual design of 200-seat common layout passenger aircraft
	完成一架200座飞翼布局客机的概念设计 Complete the conceptual design of a 200-seat flying wing layout passenger aircraft
第五批 The 5th batch	完成一架250座飞翼布局远程客机的初步设计 Complete the preliminary design of 250-seat flying wing layout long range passenger aircraft
第六批 The 6th batch	完成一架全新半宽体客机的初步设计 Complete the preliminary design of new semi wide-body passenger aircraft
第七批 The 7th batch	完成一架以液态天然气作为燃料并采用折翼机翼的大展弦比客机的初步设计和部分详细设计 Complete the preliminary design and partial detailed design of high-aspect-ratio folded wing passenger aircraft with liquid natural gas as the fuel
第八批 The 8th batch	大展弦比超长航程商务飞机的初步设计及部分详细设计 Complete the preliminary design and partial detailed design of a high-aspect-ratio super long range commercial aircraft

AVIC

第三批留英飞机班学员团队研究项目成果

Task Allocation of Research Project for the Trainees of the 3rd Batch

130座级“翔鹤”飞机项目部分详细设计
130-seat Partial detailed design of “SHOKAKU” aircraft

- ◆新一代 new generation
- ◆130座航班 130-seat airline
- ◆国内/国际航线 domestic/international flight course
- ◆2015设计交付 design delivery in 2015

结 构 Structure

- 载荷评估 Load review
- 挂浆 Sizing
- 三维CATIA模拟 3D CATIA modeling

气 动 Aerodynamics

- 气动性能研究 **Research of** Aerodynamics
- 飞行模拟数据 Fly simulation data
- 部件优化 Component optimization

航 电 Avionics

- 整体监管 Integrated Surveillance
- 着陆 Landing
- 通讯 Communication
- IVHM系统 IVHM System
- FMS系统 FMS system
- EVS系统 EVS system
- 导航系统 Navigation System

机 电 Utility

- 电力系统 Electrical Power System
- 推进&燃油系统 Propulsion & Fuel System
- 驱动系统 Actuation system
- 除冰防护系统 Ice protection system

飞 控 Flight control

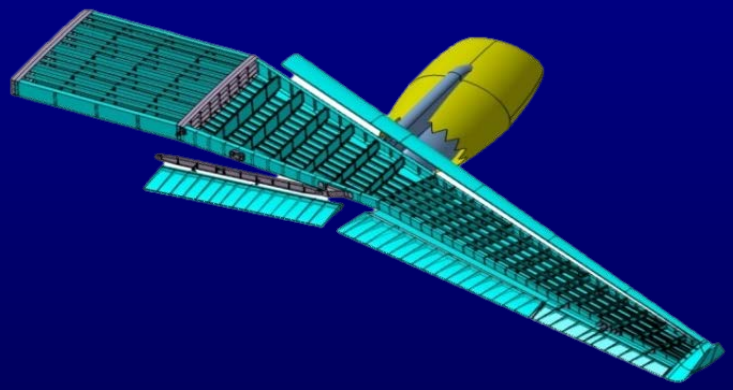
- 机翼布局 wing layout
- 临界负荷 Critical load
- 有限元分析 finite element analysis
- 应力分析 Stress analysis
- 疲劳频谱 Fatigue spectrum

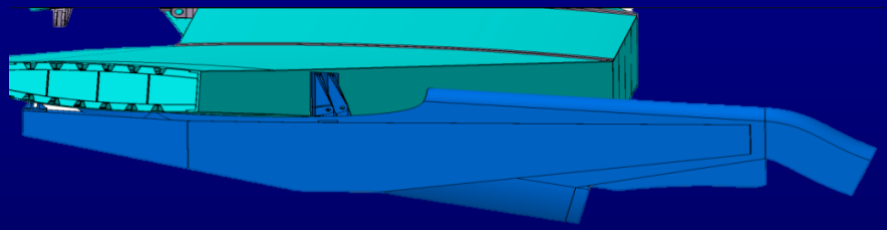
中航工业

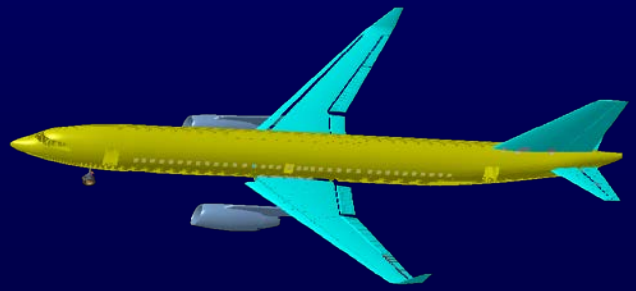
130座级“翔鹤”飞机项目部分详细设计
130-seat Partial detailed design of “SHOKAKU” aircraft

结 构 Structure | 气 动 Aerodynamics | 航 电 Avionics | 机 电 Utility | 飞 控 Flight control

结构详细设计 Structure detailed design





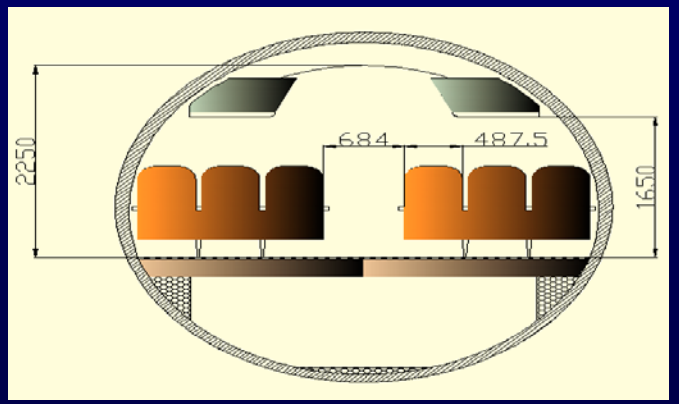


复合材料 composite material

钢合金 steel alloy

铝合金 aluminum alloy

钛合金 titanium alloy



中航工业

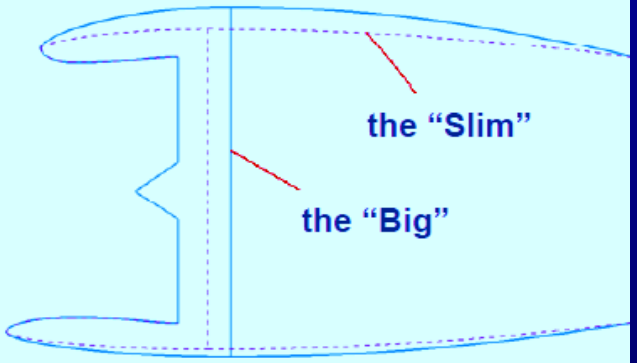
130座级“翔鹤”飞机项目部分详细设计
130-seat Partial detailed design of “SHOKAKU” aircraft

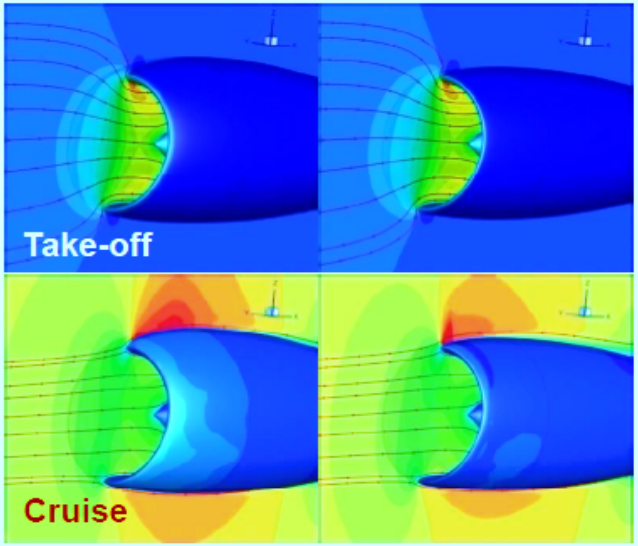
结 构 Structure | **气 动 Aerodynamics** | 航 电 Avionics | 机 电 Utility | 飞 控 Flight control

Key feature:

Acoustic benefit

Aerodynamic challenge





Nacelle Max Height

⇩

Static Performance

Similar

Critical Mach number

The “Big” the better

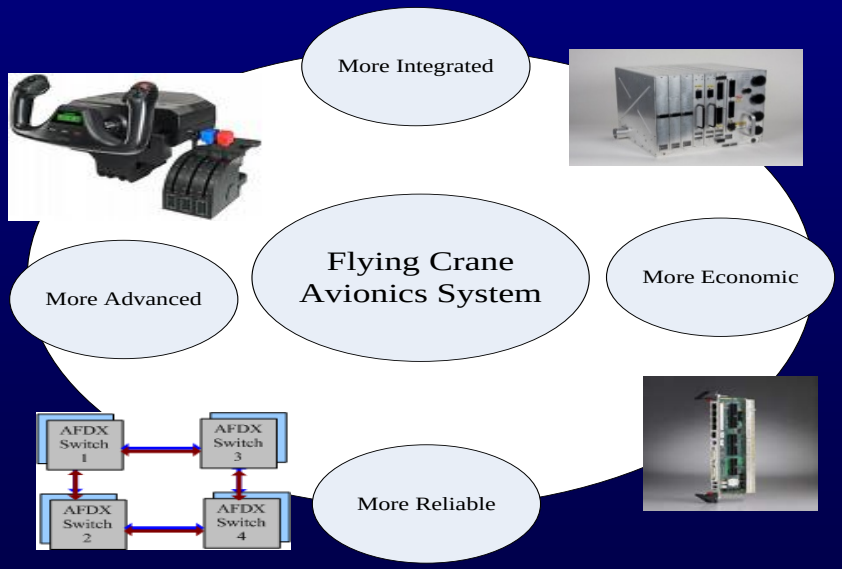
⇩

The “Big” Win!!

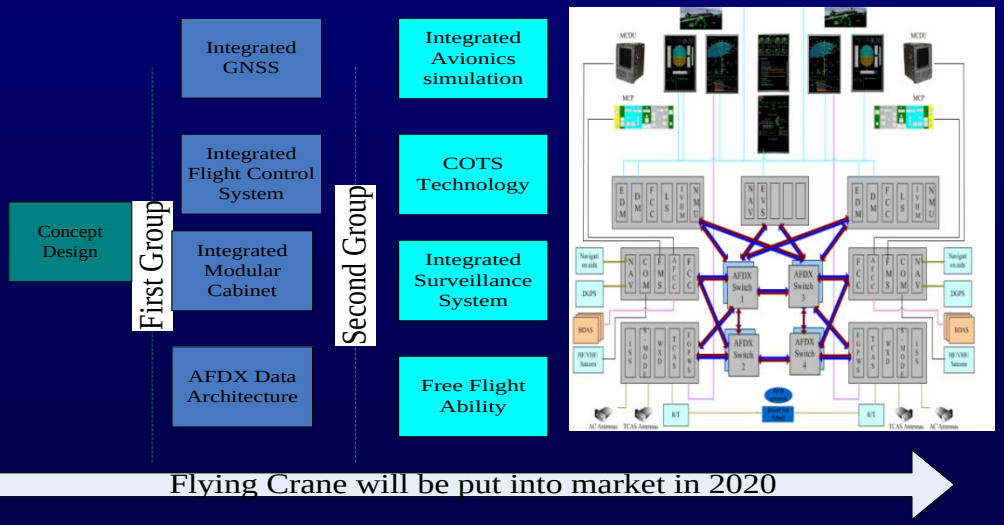
130座级“翔鹤”飞机项目部分详细设计
130-seat Partial detailed design of “SHOKAKU” aircraft

结 构 Structure | 气 动 Aerodynamics | **航 电 Avionics** | 机 电 Utility | 飞 控 Flight control

验证平台 Validation platform



航电方案 Avionics scheme

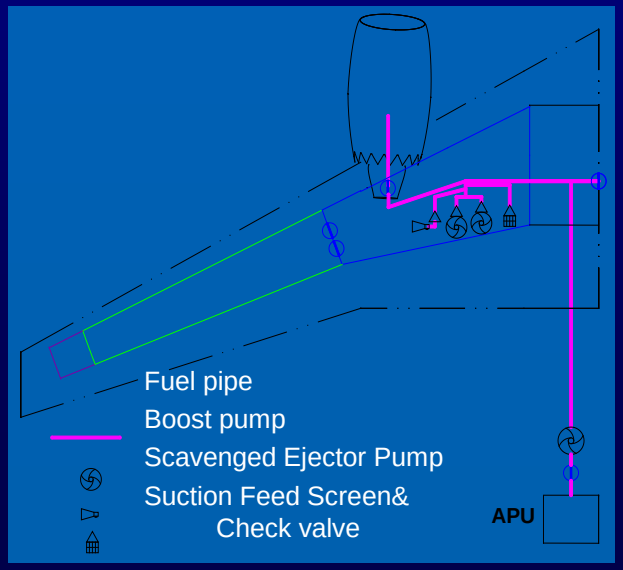


中航工业

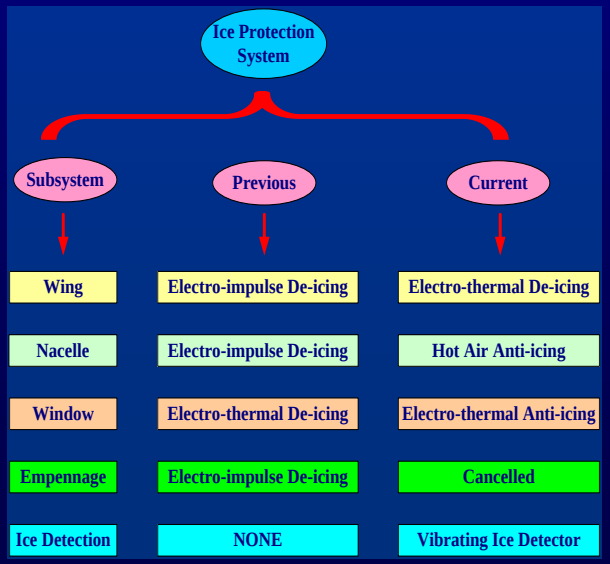
130座级“翔鹤”飞机项目部分详细设计
130-seat Partial detailed design of “SHOKAKU” aircraft

结 构 Structure | 气 动 Aerodynamics | 航 电 Avionics | 机 电 Utility | 飞 控 Flight control

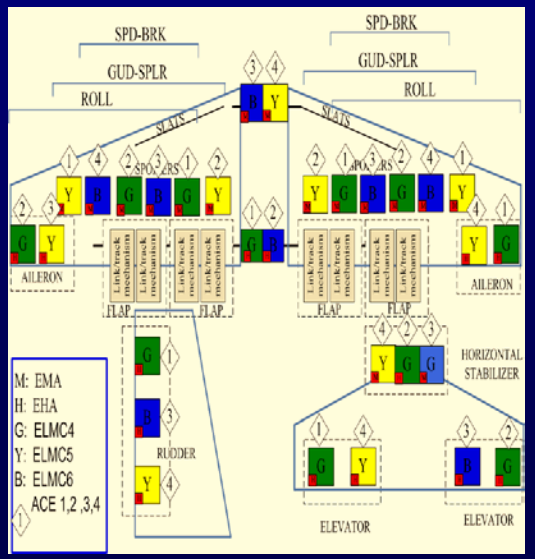
燃油方案 Fuel scheme



防冰方案 Ice protection scheme



作动方案 Actuation scheme



中航工业

130座级“翔鹤”飞机项目部分详细设计
130-seat Partial detailed design of “SHOKAKU” aircraft

结 构 Structure

气 动 Aerodynamics

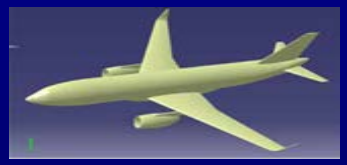
航 电 Avionics

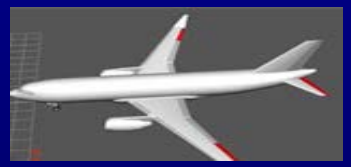
机 电 Utility

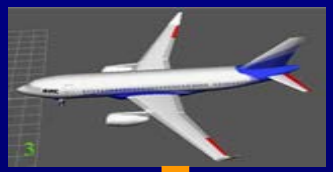
飞 控 Flight control

验证飞机动力学性能和飞控系统
Validation of aircraft dynamics and fly control system

Aircraft geometry







DATCOM

Aerodynamic coefficient

MATLAB

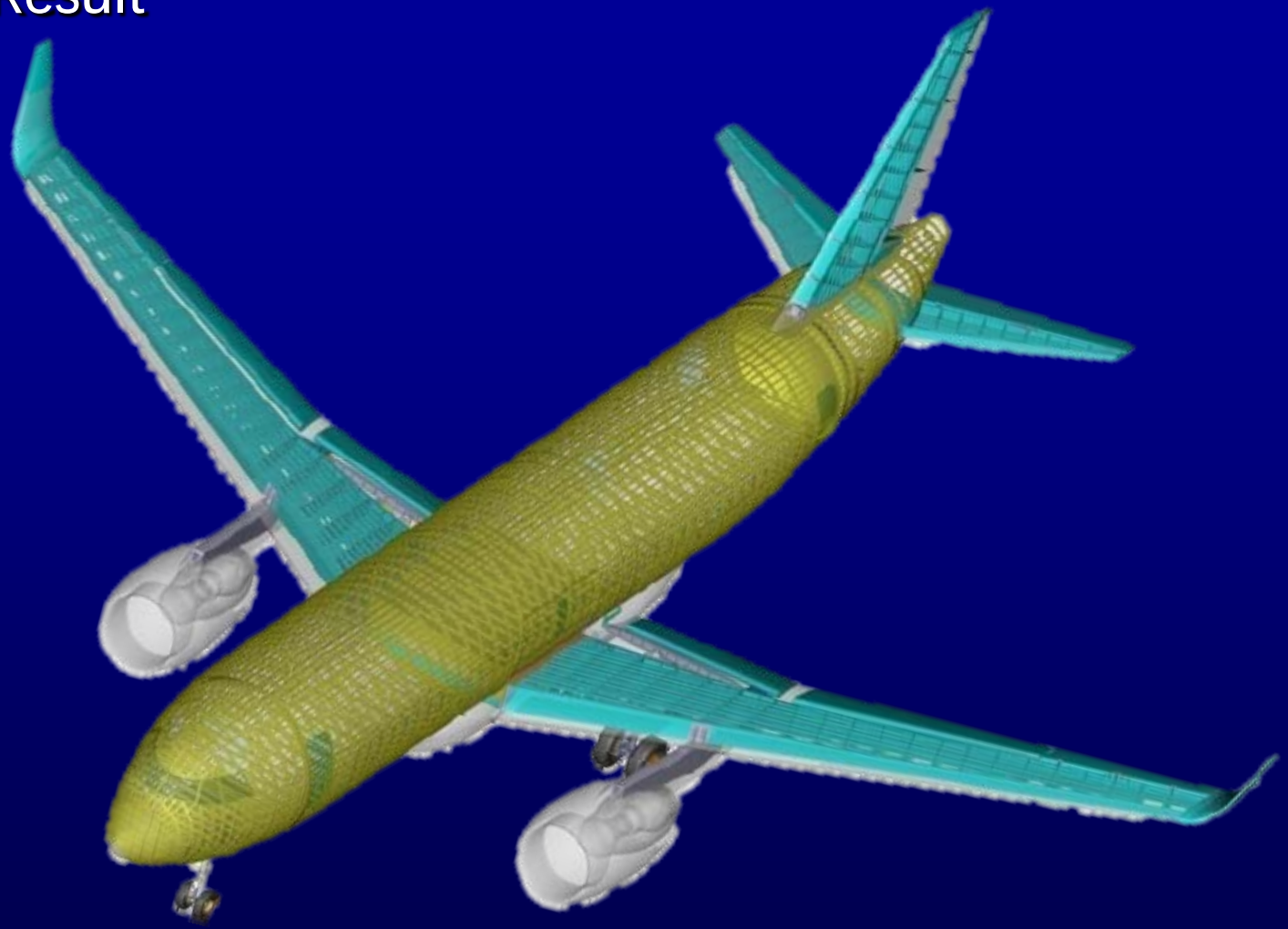
Aircraft attitude and position

FlightGear
Flying Crane Flight Simulator

Aircraft control law and aircraft 6-DoF model

Aircraft control respone

团队项目成果
Program Result



130座“翔鹤”飞机的部分详细设计

130-seat Partial detailed design of “SHOKAKU” aircraft

中航工业

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校 方
University

- 教授/技术团队合作积极、开放
  Professors and technical teams cooperate actively and openly
- 校方领导对合作重视
  Leaders of university highly value the cooperation
- 充分开放的技术交流与严谨扎实的项目管理
  The open technological exchange and effective project management
- 独特创新的面向虚拟飞机设计项目的跨专业团队研究生培养模式
  A unique and innovative postgraduates training model based on a multi-disciplinary team and the virtual aircraft design project

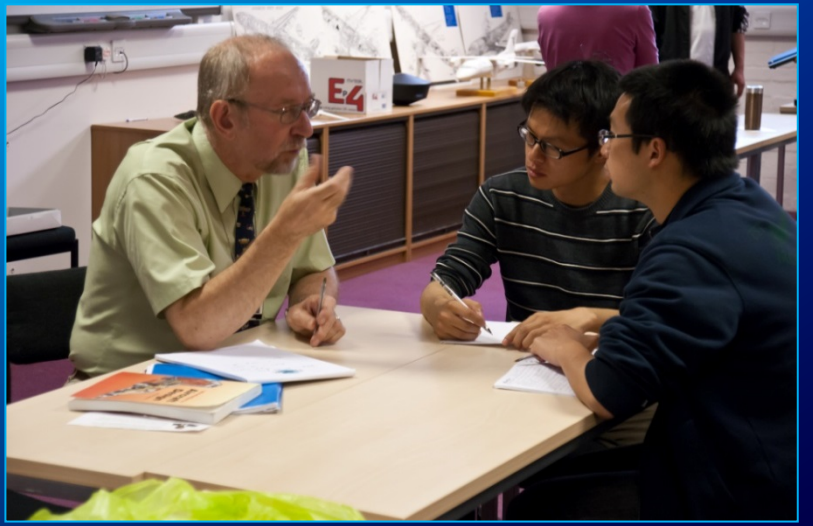
政 府
Government

- 地方政府大力支持
  Local governments' full support
- 国家政府主管部门积极参与
  Government agencies' active participation

AVIC

导师团队深度介入教学

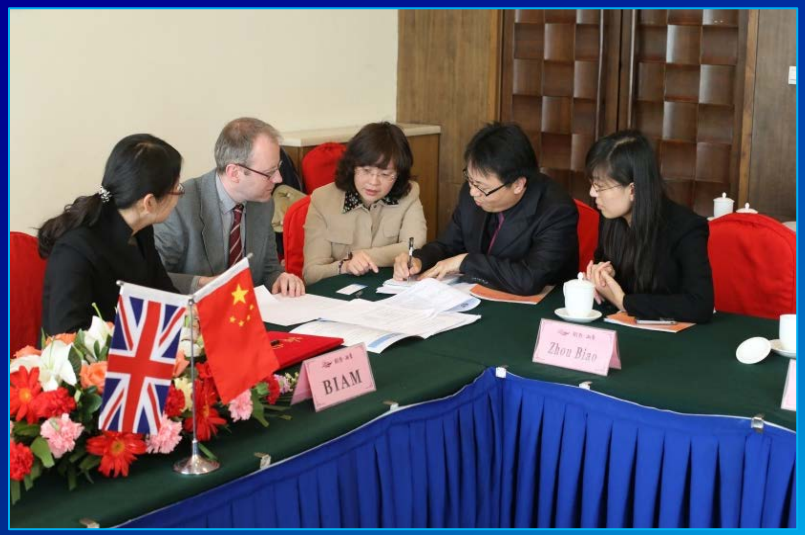
Tutor Team Actively Involved in Class

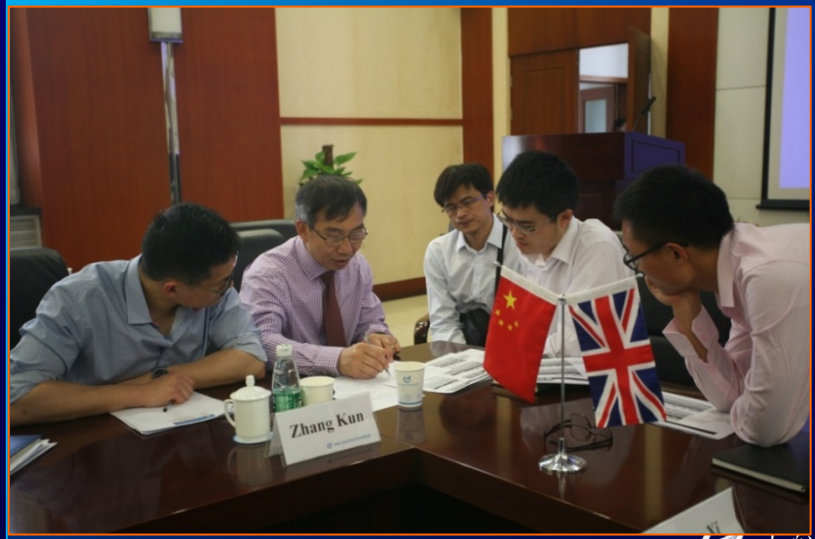


指导与研讨深入而热烈

Helpful Guidance and Heated Discussion

技术合作与交流交互进行
Technical Cooperation and Exchanges






Imperial College
London
中航工业
AVIC Centre
for Structural Design and Manufacture
帝国理工 ICL

诺丁汉大学 Nottingham Univ.

曼切斯特市长亲自接见中航工业代表团

Manchester Mayor Met with the Delegation of AVIC

建议
Suggestions

政府制定校企合作优惠政策，鼓励二者合作向纵深发展

The government should develop preferential policy of university-industry cooperation for deeper collaboration between the two sides.

- 建立长期、稳固中英校企合作机制，扩大中英合作范围

  To establish a long-term and stable Sino-UK university-industry cooperation mechanism to expand the Sino-UK cooperation in general

- 进一步利用中航工业大学技术中心，开展成果转移工作

  To further yield the research results transferred through AVIC University Technology Centers (UTC)

谢　谢！

Thanks