

**Dr. Ahmed Z. Al-Garni**

**Résumé**

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## Personal Data

<i>Name</i>	<b>AHMED Z. AL-GARNI</b>
<i>Date and Place of Birth</i>	1953 (1372H), Alkhobar, The Kingdom of Saudi Arabia (KSA)
<i>Marital Status</i>	Married with Family
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## Education:

**[The first in KSA & Arab World to earn four degrees in Aerospace Engineering]**

1407-1412 (1987-1991)	<b>Ph.D.</b> , in Aerospace Engineering (Flight Dynamics and Control in the Atmosphere and Space). <b>The University of Maryland</b> , College Park, Maryland, U.S.A. ( <i>The Ph.D. dissertation field was the first of its kind in the world</i> )
1405-1407 (1985-1987)	<b>M.S.</b> , in Aerospace Engineering (Flight Dynamics & Control and Astrodynamics), <b>The University of Michigan</b> , Ann Arbor, Michigan, U.S.A.
1401-1404 (1981-1983)	<b>M.S.</b> , in Aerospace Engineering (Flight Dynamics & Control and Aerodynamics), <b>The University of Arizona</b> , Tucson, Arizona, U.S.A.
1396-1401 (1976-1981)	<b>B.S.</b> , in Aerospace Engineering (General AE), <b>The University of Arizona</b> , Tucson, Arizona, U.S.A.

## Employment History

1423-Present (2002-Present)	<b>Professor &amp; Chairman</b> of Aerospace Engineering (AE) Department
1421-1423 (2001-2002)	<b>Professor</b> of Aerospace Engineering (AE) at Mechanical Engineering (ME) Department, KFUPM, Dhahran, KSA.
1419-Present (1998-Present)	Aerospace Engineering (AE) Program <b>Director</b>
1417-1421 (1996-2000)	<b>Associate Professor</b> of AE at ME Department, KFUPM, Dhahran, KSA
1412-1417 (1991-1996)	<b>Assistant Professor</b> of AE at ME Department, KFUPM, Dhahran, KSA
1404-1412 (1984-1991)	<b>Lecturer</b> of AE at ME Department, KFUPM, Dhahran, KSA. <i>(This includes the years I was a student in the second M. S. and Ph.D.)</i>
1395-1404 (1975-1984)	<b>Aerospace Engineer</b> (Student and Employee) at the Royal Saudi Air Force (RSAF), KSA. <i>(This include the years I was a student in the B.S., and first M.S., and also my work as a Graduate Student and Researcher at the University of Arizona and the National Aeronautics and Space Administration [NASA], Ames, U.S.A.)</i>

## Career Objectives and Major Research Interests

### Career Objectives:

To make significant contribution to the development and dissemination in the field of Aerospace Engineering, through the following: teach, conduct research, provide consultation, do translation, give public lectures/talks, write articles/books, and develop the field of Aerospace Engineering in the region.

### Research Interest:

Applied and fundamental areas of **Aerospace Engineering**, using **analytical**, **numerical**, and **experimental** methods. The research activities can be categorized in **three** areas:

- Flight dynamics and control in atmosphere and space; including aerodynamics and aerodynamic heating.
- Modeling and simulation of AE systems, including control and optimization and reliability of aircraft maintenance.
- Interdisciplinary problems in Aerospace Engineering and other areas (AE Education, flight safety & security, Laser application in materials, system and energy modeling, renewable energy and other).

## Honors, Recognition and Achievement

- Received **King Abdulaziz Al-Saud Legion of Honor for the Excellent Degree for Scientific Patent**, from the **Custodian of Two Holy Mosques, Abdullah Bin Abdul Aziz** 2006 (1427H).
- Received **King Abdul Aziz Al-Saud Legion of Honor Medal for the first degree for Scientific patent**, based on the Royal Directive Decision, by the **Custodian of Two Holy Mosques**, 2004 (1425H)
- Received **appreciation/letter of appreciation** from many leading personalities (e.g., **H.R.H. Prince Sultan Bin Abdul Aziz, H.R.H. Prince Abdulmajid Bin Abdul Aziz** and **H.R.H. Prince Mohammed Bin Fahd Bin Abdul Aziz**).
- Received **Distinguished Engineering Scientist Award** Patronized by **H.R.H. Prince Ahmad Bin Abdul Aziz** in 2003 (1424H). The award was supervised by **KACST**. (The **first** in KSA to receive this award).
- Received **Three Awards for Scientific Patents** from KFUPM for “**Movable Surface Plane**” on Wing, US Patent KFUPM 2004 (1425 H) and “**Hybrid Cooling System and Method for Cooling Electronic Devices**” 2006 (1427H), and “**A Submarine for Water Purification,**” 2007 (1428H).
- More Patents are submitted to American Patent and Trademark Office 2006 (1427H).
- Received **Award for Distinguished in Teaching & Academic Advising** in KFUPM, 2004 (1425H).
- Received the **Distinguished Researcher Award** from the King Fahd University of Petroleum & Minerals, academic year 1998-1999 (1418-1419H).
- Received **Distinguished** evaluation for the overall performance (in teaching, research, and community service) for **all the years** at KFUPM, since 1992-1993 (1412-1413H) to present.
- **Received Certificate in appreciation of twenty years of service to KFUPM**, 2004 (1425H).
- One of a small group in the world to publish in **5 out of 6 Journals of AIAA** (the most prestigious institution in the world for AE). Published/submitted **about 100** papers in international Journals and Conferences.
- Appointed/Elected to **leading positions related to AE** field at KFUPM, such as, the **first** chairman of Aerospace Engineering department, **first** Director of Aerospace Engineering Program, Aero-Lab Director, Aerospace Engineering Program Committee Chairman, Aerospace Group Coordinator, **first** coordinator for Aeronautics Group, since 1992-1993 (1412-1413H)-present.

- Appointed on the ***Editorial Advisory Board*** for the Civil Aviation Magazine, issued by the Ministry of Defense & Aviation, KSA, 1998 (*1418 H*) -present.
- Listed in the ***leading biographies***, such as 5<sup>th</sup> Edition of Who's Who in Science and Engineering; 16<sup>th</sup> and 17<sup>th</sup> Editions of Who's Who in the World; 6<sup>th</sup> Edition of ABI International Directory of Distinguished Leadership.
- Established a national and international ***recognition in the AE field***, such as, received many invitations to give speeches; consultation at many occasions, review research papers for AIAA and ASME and others; chosen by the American People-to-People Program from the region as a member of an International Aerospace Engineering Education Delegation to visit Russian Aerospace Program, and received many plaques and certificates and letters of appreciation (from KFUPM, Ministry of Higher Education, RSAF, Saudi Arabia Airlines, and others), since 1991 (*1412H*)-present. Established the **first** AE program and Department in the region.
- ***J. H. School and H. School Honors***, 1390-1395 H (1970-1975); and ***B.S. Honors***, the University of Arizona Honors, 1981 (*1401H*).

### Membership of Professional Societies

- American Institute of Aeronautics and Astronautics (**AIAA**), as a ***Senior Member***.
- International Association for Hydrogen Energy.

### Teaching and Other Activities

- Taught many required and elective courses in undergraduate and graduate programs at different university levels, with average student evaluation **over 9 out of 10** in over 12 years, and many positive comments and appreciation from the students. The courses taught/coordinate are:

<u><i>Course #</i></u>	<u><i>Course Title</i></u>	<u><i>Credit-Contact (Hours) Taught</i></u>
AE 220	Introduction to Aerospace Engineering	3-3
AE 350	Aerospace Engg. Cooperative Work	9+Coordination
AE 411, AE 412	Aerospace Engg. Senior Project	3+Coordination
AE 426	Flight Dynamics I	3-3
AE 427	Aerospace Engineering System Design	3-3
AE 599	Seminar	0
AE 610	Thesis	6-Thesis
ME 201	Dynamics	3-3
ME 203	Thermodynamics I	3-3

ME 301	Fluid Mechanics (Lab)	1-3
ME 320	Introduction to Aeronautics	3-3
ME 350	Mechanical Engg. Cooperative Work	9
ME 411	Mechanical Engg. Senior Project	3-3
ME 433	Introduction to Aerodynamics	3-3
ME 426	Flight Mechanics	2-2
ME 426	Flight Mechanics (Lab)	1-3
ME 433	Introduction to Aerodynamics	3-3
ME 520	Fundamentals of Astronautics	3-3
ME 610	Thesis	6-Thesis
SE 001	Math Analysis	3-3

- Supervised over **100** Senior Projects and Co-op students, and evaluated many Summer Training Reports.
- Advised, on an average, over **30** undergraduate students every semester including all AE students for over **15** years.
- Supervised/Committee member of over **10** M.S. and Ph.D. students.
- ***Aeronautics/Aerospace Group Coordinator***, from 1412 (1992)-Present. The primary purpose of the group activities is to improve research, teaching, and other related activities in the ME Department, KFUPM.
- ***Heavily involved*** in courses, labs, curriculum, and programs development, especially for the ***Aerospace Engineering program***, in the last twenty years.
- ***Proposed and initiated*** a short- and long-plan to develop the AE field and to open AE Department in 1404 (1984).
- In 1413-1414 (1993-1994), ***studied and proposed a comprehensive program for AE*** and its department. The study includes the need and job opportunity in KSA and the region, student enthusiasm and enrollment, cost, facilities, faculty, and curriculum.

This study gave the breath of ***the Aerospace Engineering Program in 1419 (1998), with the following new/modified 24 courses:***

AE 220	Introduction to Aerospace Engineering
AE 325	Gas Dynamics I
AE 328	Flight Structures I
AE 333	Aerodynamics I

AE 350/351	Aerospace Engineering Cooperative Work
AE 399	Summer Training
AE 401	Aerospace System Maintenance
AE 402	Aerospace Avionics
AE 410	Astronautics
AE 411	Senior Design Projects I
AE 412	Senior Design Projects II
AE 414	Flight Traffic Control and Safety
AE 420	Aerospace Engineering Lab I
AE 421	Aerospace Engineering Lab II
AE 422	Flight Propulsion I
AE 426	Flight Dynamics I
AE 427	Aerospace System Design
AE 428	Flight Structures II
AE 429	Gas Dynamics II
AE 433	Aerodynamics II
AE 442	Flight Propulsion II
AE 446	Flight Dynamics II
AE 450	Computational Methods for Aerospace Engineering
AE 499	Special Topics in Aerospace Engineering (Helicopter)

- Among the group who **initiated, proposed**, and established the Aeronautical Engineering Option at ME-KFUPM in 1986 (*1406H*) with 6 courses (ME 320, ME 422, ME 425, ME 426, ME 428, ME 333), later initiated ME 420 AE Lab in 1998 (*1419H*).
- **Initiated** and **established** the 1<sup>st</sup> M.S. in Aerospace Engineering in KSA with 19 courses.

AE 520	Aerodynamics of Compressible Flow
AE 524	Aerodynamics of Viscous Flow
AE 530	Aerospace Structures I
AE 534	Aerospace Structures II
AE 540	Flight Dynamics and Control I
AE 544	Flight Dynamics and Control II
AE 550	Aircraft Propulsion
AE 554	Rocket Propulsion

AE 528	Aerospace Computational Fluid Dynamics
AE 546	Fundamentals of Helicopter Flight
AE 548	Aerospace Avionics, Navigation and Guidance
AE 560	Aerospace and Aviation Maintenance
AE 564	Air Traffic Control
AE 566	Flight and Aviation Safety
AE 568	Flight and Aviation Law
AE 570	Fundamentals of Astronautics
AE 590	Special Topics
AE 599	Seminar
AE 610	M.S. Thesis

- **Initiated, taught and developed** AE 220/ME 320 (Introduction to AE/Introduction to Aeronautics) and ME 520 (Fundamentals of Astronautics), and AE 427 (Aerospace System Design) for the *first* time in KSA, and suggested many textbooks/references.
- Established the **first** AE Program and the **first** AE Department in the region.
- During 1412-1416 (1992-1996): Prepared and developed two **Laboratory Manuals** for ME 426 (Flight Mechanics) and ME 433 (Introduction to Aerodynamics). Preparing two **more Laboratory Manuals** for AE 420 (AE Lab I) and AE 421 (AE Lab II) for the new AE program courses.
- **Initiated and ordered** a Rollab (I6B312) internal six component strain gauge **balance**, to measure the force and moment systems on wind tunnel models with the balance an **altitude mechanism** (ATM 312) and a **software** for the system allows the display of many features, such as a digital readout of the instantaneous angle of attack and calculation of lift, drag, forces and moments coefficient. *Participated in the development of the system, specially the software program, which has been highly appreciated by both Rollab Company (of Sweden) and Helsinki University of Technology (of Finland)*. The process for ordering the complete system of the balance, with installation and testing started since 1412 (1991) and is continuing till present.
- Supervised the design, fabrication, and manufacture of **several wind tunnel models**, such as delta wing, two Boeing airplane, vertical axis wind energy system, airfoil, and missiles. Some of them were used in the wind tunnel balance for teaching and research purposes.
- As the **Aero-Laboratory Director**, since 1419 (1998)-present, involved in the management of the two labs affairs. They are: (1) Aerodynamic and Flight Dynamic Lab, which is used mainly for teaching ME 426, ME 433, ME 420, AE 420, AE 421 and some other projects. (2) Wind Tunnel Lab, which is meant mainly for research. At the same time, working to extend the Aero Lab to have a **new four Aerospace Engineering Labs** (including advance



aerodynamics lab, flight dynamics and control, aerospace structure and maintenance, and propulsion).

- Initiated and participated in the **construction** of the new Aerospace Engineering Laboratory. This include two parts:
- Supervised the construction of a base to accommodate an **airplane**, which has been donated by **H. R. H. Prince Sultan Ibn Abdul’Aziz**, to the Aerospace Engineering Program in KFUPM.
- Supervised the construction of a Lab to house the new **Aerospace equipments** (e.g., landing gears, airplane’s major and minor parts, which have been obtained from the AE industries).
- Initiated, ordered and supervised the assembly of **many aircraft kit models** which fly by remote control and are used in teaching in Aeronautics Engineering Option and Aerospace Engineering Program courses, such as ME 426/AE 426.
- Initiated and supervised a **project for the reduction of the test section** in the Wind Tunnel in order to increase the free stream speed by about 40%, and to fit some needed projects for M. S. thesis and other research.
- Supervised **Sagger Al-Jazera** program to build and operate student projects (e.g., **hang-gliders, remote controlled airplanes, submarines, missiles, and solar energy car**).
- Gave many **consultations** (e.g., Royal Saudi Air Force, Space Research Institute - KACST), and **reviewed** many articles for leading journals and conferences (such as, AIAA, ASME).
- Working with the **local aerospace and engineering industries** (e.g., Royal Saudi Air Force, Saudi Aramco aviation Department) to develop the AE Lab.
- Initiated/suggested the ordering of **hundreds references** (books, journals, proceedings, papers and manuals) for Aerospace Engineering subjects to the library.
- Involved in the development of the ME curriculum, especially zero-base and ABET course files preparation, textbooks evaluation and searching ME undergraduate/graduate programs developments.
  - Coordinated/participated in teaching over **10** short courses.
  - Offered and coordinated the first short course of the AE Department titled, “**Aerospace Engineering Science and Technology**”, held in 2004 (*1425H*)
- Invited to give many lectures and talks about AE and other fields, which were received with **appreciation** to both the KFUPM and myself, and participated in many TV and Radio program.
- **Heavily involved** in committees work, with an average of **10** committees per year and

served in over **100** committees in the last 13 years such as:

- Islamic studies Committee.
- Arabic Book Authorship & Translation Committee.
- First workshop on Patenting of Intellectual Property presentation Committee.
- Academic Committee.
- Provide professional consultation to Royal Saudi Air Force (RSAF) and Saudi Armed Forces in various Aerospace Engineering Activities.
- Contributed in holding the first workshop on patenting of Intellectual Property committee
- Member of the editorial board of the Civil Aviation.
- His research work has been cited in hundred research publications and others.

## **Research and Publications**

- (a) **Refereed Journals** (*one of a small group in the world to publish in 5 out of 6 AIAA Journals, the most prestigious institute for AE in the world*).
- (1) **A. Z. Al-Garni**, “Analytical Solution for Controls, Heats and States of Flight Trajectories,” *AIAA - Journal of Spacecraft and Rockets*, Vol. 31, No. 5 (1994), pp.924-928 (Technical Note) (*1414H*).
  - (2) A. Z. Sahin, B. S. Yilbas, and **A. Z. Al-Garni**, “Transient Heat Conduction in a Slab During Direct Resistance and Induction Heating,” *International Communication in Heat and Mass Transfer Journal*, Vol. 21, No. 2 (1994), pp.199-206 (*1414H*).
  - (3) **A. Z. Al-Garni**, S.M. Zubair, and J. S. Nizami, “A Regression Model for Electric Energy Consumption Forecasting in Eastern Saudi Arabia,” *Energy - The International Journal*, Vol. 19, No. 10 (1994), pp.1043-1049 (*1414H*).
  - (4) **A. Z. Al-Garni**, A. Z. Sahin, B. S. Yilbas, and S. A. Ahmed, “Cooling of Aerospace Plane Using Liquid Hydrogen and Methane,” *AIAA - Journal of Aircraft*, Vol. 32, No. 3 (1995), pp.539-546 (*1415H*).
  - (5) B. S. Yilbas, A. Z. Sahin, N. Kahraman, and **A. Z. Al-Garni**, “Friction Welding of St-Al and Al-Cu Materials,” *Journal of Materials Processing Technology*, Vol. 49 (1995), pp.431-443 (*1415H*).
  - (6) S. A. Ahmed, A. S. Nejad, and **A. Z. Al-Garni**, “A Comparative Study of the Effects of LDV Velocity Bias in the Near Field of a Turbulent Free Jet,” *Canadian Aeronautics and Space Journal*, Vol. 41, No. 4 (1995), pp.179-184 (*1415H*).
  - (7) **A. Z. Al-Garni**, K. A. F. Moustafa, and S. S. A. K. J. Nizami, “Optimal Control of Overhead Cranes,” *Control Engineering Practice (A Journal of IFAC - The International*

- Federation of Automatic Control Engineering*), Vol. 3, No. 9 (1995), pp.1277-1284 (1415H).
- (8) S. S. A. K. Javeed Nizami, and **A. Z. Al-Garni**, "Forecasting Electric Energy Consumption Using Neural Networks," *Energy Policy*, Vol. 23, No. 12 (1995), pp.1097-1104 (1415H).
  - (9) **A. Z. Al-Garni**, and A. Z. Sahin, "Designing a Cooling System for an Aerospace Plane Using H<sub>2</sub>, CH<sub>4</sub>, NH<sub>3</sub>, Kr and Xe," *Canadian Aeronautics and Space Journal*, Vol. 41, No. 4 (1995), pp.193-201, (1415H).
  - (10) **A. Z. Al-Garni**, and J. B. Barlow, "Aerospace Plane Ascending Trajectories with Heat Consideration," *IMEchE - Part G: Journal of Aerospace Engineering*, Vol. 210 (1996), pp.231-245 (1416H).
  - (11) A. Z. Sahin, B. S. Yilbas, and **A. Z. Al-Garni**, "Friction Welding of Al-Al, Al-Steel, and Steel-Steel Samples," *Journal of Materials Engineering and Performance*, Vol. 5, No.1 (1996), pp.89-99 (1416H).
  - (12) **A. Z. Al-Garni**, A. Z. Sahin, and B. S. Yilbas, "Active Cooling of a Hypersonic Plane Using Hydrogen, Methane, Oxygen and Fluorine," *IMEchE - Part G: Journal of Aerospace Engineering*, Vol. 210 (1996), pp.9-17 (1416H).
  - (13) B. S. Yilbas, A. Z. Sahin, **A. Z. Al-Garni**, S. A. M. Said, Z. Ahmad, B. J. Abdul Aleem, and M. Sami, "Plasma Nitriding of Ti-6 Al-4 V Alloy to Improve Some Tribological Properties," *Surface and Coatings Technology*, Vol. 80, No. 3 (1996), pp.287-292 (1416H).
  - (14) **A. Z. Al-Garni**, "Comparison of H<sub>2</sub>, CH<sub>4</sub> and H<sub>2</sub>O for Cooling Aerospace Planes," *International Journal of Hydrogen Energy*, Vol. 21, No. 3 (1996), pp.229-237 (1416H).
  - (15) A. K. Sheikh, **A. Z. Al-Garni**, and M. A. Bader, "Reliability Analysis of Airplane Tires," *International Journal of Quality and Reliability Management*, Vol. 13, No. 8 (1996), pp.28-38 (1416H).
  - (16) S. A. Ahmed, A. S. Nejad, and **A. Z. Al-Garni**, "Near-Field Study of a Turbulent Free jet and Velocity Bias Effects," *AIAA - Journal of Propulsion and Power*, Vol. 12, No. 1 (1996), pp.155-157 (1416H).
  - (17) **A. Z. Al-Garni**, "Closed-Form Control and State Solutions for Flight with Equality Constraints," *Transactions of the Japan Society for Aeronautical and Space Sciences (Journal)*, Vol. 39, No. 124 (1996), pp.231-247 (1416H).
  - (18) B. S. Yilbas, **A. Z. Al-Garni**, and A. Z. Sahin, "Study into a Small Scale Water Driven Domestic heat Pump: Design and Performance Analysis," *Energy Sources (Journal)*, Vol. 18, No. 8 (1996), pp.951-963 (1416H).

- (19) B. S. Yilbas and **A. Z. Al-Garni**, "Some Aspects of Laser Heating of Engineering Materials," *Journal of Laser Applications*, 8(4) (1996), pp.197-204 (1416H).
- (20) **A. Z. Al-Garni**, "Aerospace Plane Cooling with H<sub>2</sub>, CH<sub>4</sub>, He, Ne, N<sub>2</sub> and Ar," *AIAA - Journal of Thermo physics and Heat Transfer*, Vol. 39, No. 16 (1996), pp.3431-3439 (1416H).
- (21) S. M. Zubair, **A. Z. Al-Garni**, and J. S. Nizami, "The Optimal Dimensions of Circular Fins with Variable Profile and Temperature-Dependent Thermal Conductivity," *International Journal of Heat Mass Transfer*, Vol. 39, No. 16 (1996), pp.3431-3439 (1416H).
- (22) **A. Z. Al-Garni**, "Comparison of Aircraft Tire Replacement Policy at Saudi Aviation Facility to the International standards," *Journal of Quality in Maintenance Engineering*, Vol. 2, No. 4 (1996), pp.71-80 (1416H).
- (23) **A. Z. Al-Garni**, Y. N. Al-Nassar, S. M. Zubair, and A. Al-Shehri, "Model for Electric Energy Consumption in Eastern Saudi Arabia," *Energy Sources*, Vol. 19, No. 4 (1997), pp.325-334 (1417H).
- (24) **A. Z. Al-Garni**, A. Z. Sahin, and A. A. Al-Farayedhi, "A Reliability Study of Fokker F-27 Airplane Brakes," *Reliability Engineering and System Safety* (Journal affiliated with ASME), Vol. 56, No. 2 (1997), pp.143-150 (1417H).
- (25) R. E. Abdel-Aal, **A. Z. Al-Garni**, and Y. N. Al-Nassar, "Modeling and Forecasting Monthly Electric Energy in Eastern Saudi Arabia Using Abductive Networks," *Energy - The International Journal*, Vol. 22, No. 9 (1997), pp.911-921 (1417H).
- (26) **A. Z. Al-Garni**, "Neural Network-Based Failure Rate for Boeing-737 Tires," *AIAA - Journal of Aircraft*, Vol. 34, No. 6 (1997), pp.771-777 (1417H).
- (27) R. E. Abdel-Aal, and **A. Z. Al-Garni**, "Forecasting Monthly Electric Energy Consumption in Eastern Saudi Arabia Using Univariate Time-Series Analysis," *Energy - The International Journal*, Vol. 22, No. 9 (1997), pp.1059-1069 (1417H).
- (28) **A. Z. Al-Garni**, "Closed-Form Solutions for Flight Vehicles with High Thrust Angle," *Canadian Aeronautics and Space Journal*, Vol. 43, No. 3 (1997), pp.160-168 (1417H).
- (29) A. Z. Sahin, and **A. Z. Al-Garni**, "Transient Temperature Analysis of Airplane Carbon Composite Disk Brakes," *AIAA - Journal of Thermo physics and Heat Transfer*, Vol. 12, No. 2 (1997), pp.283-285. (Technical Note) (1417H).
- (30) **A. Z. Al-Garni**, "Hawle Elm Al-Harakah va Al-Taqueem ... (Arabic, which means: In Science of Motion, Timing and Calendar)," *Journal of Imam Muhammad Ibn Saudi Islamic University*, No. 20 (1998), pp.533-564. (In Arabic) (1418H).

- (31) **A. Z. Al-Garni**, S. A. Ahmed, and M. Siddique, "Modeling Failure Rate for Fokker F-27 Tires Using Neural Network," *Transactions of the Japan Society for Aeronautical and Space Sciences*, Vol. 41, No. 131 (1998), pp.29-37 (1418H).
- (32) **A. Z. Al-Garni**, A. Z. Sahin, A. Al-Ghamdi, and S. A. Al-Kaabi, "Reliability Analysis of Airplane Brakes," *Quality and Reliability Engineering International*, Vol. 15 (1999), pp.143-150 (1419H).
- (33) S. A. Ahmed, and **A. Z. Al-Garni**, "Budgets of Turbulent Kinetic Energy in an Abruptly Expanding Circular Duct," *Transactions of the Japan Society for Aeronautical and Space Sciences*, Vol. 42, No. 135 (1999), pp.1-8 (1419H).
- (34) **A. Z. Al-Garni**, A. Z. Sahin, and A. A. Al-Farayedhi, "Modeling of Weather Characteristics and Wind Power in the Eastern Saudi Arabia," *International Journal of Energy Research*, Vol. 23 (1999), pp.805-812 (1419H).
- (35) A. Kharab, and **A. Z. Al-Garni**, "Use of a Spreadsheet Program in Aerospace Plane Trajectory," *IASTED - International Journal of Modeling and Simulation*, Vol. 19, No. 3, (1999), pp. 220-225, (1419H).
- (36) S. A. Ahmed, **A. Z. Al-Garni**, and K. B. Abidogun, "The Flow Field Characteristics of a Confined Highly Swirling Turbulent Flow," *Canadian Aeronautics and Space Journal*, Vol. 45, No. 4 (1999), pp.323-334 (1420H).
- (37) A. M. Al-Qutub, and **A. Z. Al-Garni**, "Comparison Between Neural Network and Weibull Models for Failure of Boeing 737 Engines," *Transactions of the Japan Society for Aeronautics and Space Sciences*, Vol. 42, No. 137 (1999), pp.128-134 (1420H).
- (38) A. Z. Sahin, **A. Z. Al-Garni**, M. Sunar, and R. Kahraman, "Thermal Analysis of Antiskid Aircraft Brake System," *Transactions of the Japan Society for Aeronautical and Space Sciences*, Vol. 42, No. 138 (2000), pp.153-158 (1421H).
- (39) **A. Z. Al-Garni**, A. M. Al-Garni, S. A. Ahmed, and A. Z. Sahin, "Flow Control for an Airfoil having Leading-Edge Rotation: An Experimental Study," *AIAA - Journal of Aircraft*, Vol. 37, No. 4 (2000), pp.617-622 (1421H).
- (40) Y. N. Al-Nassar, M. Siddique, and **A. Z. Al-Garni**, "Artificial Neural Networks in Vibration Control of Rotor Bearing Systems," *Simulation Practice and Theory*, Vol.7, No. 8 (2000), pp.729-740 (1421H).
- (41) A. Z. Sahin, S. M. Zubair, **A. Z. Al-Garni**, and R. Kahraman, "Effect of Fouling on the Operational Cost in Pipe Flow Due to Entropy generation," *Energy Conversion and Management*, Vol. 41, No.14 (2000), pp.1485-1496 (1421H).
- (42) A. Z. Sahin, **A. Z. Al-Garni**, and A. A. Al-Farayedhi, "Analysis of a Small Horizontal Axis Wind Turbine Performance," accepted by *International Journal of Energy Research* (2000) (1421H).

- (43) **A. Z. Al-Garni**, S.A. Ahmed, A. Z. Sahin and A. M. Al-Garni, “Experimental study of a 65 degree-delta wing with different pitching rates”, *Canadian Aeronautics and Space Journal*, Vol. 47, No. 2, (2001), pp. 85-93 (1422H).
- (44) M. Sunar, **A. Z. Al-Garni**, M. H. Ali, and R. Kahraman, “Finite Element Modeling of Thermo-piezomagnetic Smart Structures,” *AIAA - Journal*, Vol. 40, No. 9, (2002) , pp. 681-691, (1423H).
- (45) A. Z. Sahin and **A. Z. Al-Garni**, “Environmental Impact of Hydrogen Energy Use”, *Renewable Energy-UNESCO*, (2003), pp. 93-95, (1424H).
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- (50) Saeed, F., and **A. Z. Al-Garni**, “An Analysis Method for Inertial Particle Separator”, *The AIAA Journal of Aircraft*, Vol.44, No.4, (2007), pp.1150-1158 (1428H).
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- (53) **A. Z. Al-Garni**, A. Jamal, F. Saeed, and A. Kassem, “Failure Rate Analysis of Boeing 737 Brakes Employing Neural Network,” *International Journal of Reliability, Quality & Safety Engineering*, (2007) (1428H).
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- (59) **A. Z. Al-Garni**, Tozan M and Abdulrehman, W.G., “Managing Field Failures of Aircraft Systems by Co-application of Parametric and Non-parametric Methods”, Accepted for publication in *Journal of Aircraft*, Nov. 2010 (1431H)
- (60) A. Saad, A. Z. Sahin, and **A. Al-Garni**, “Measurements in the radial vaneless diffuser of a centrifugal blower”, *Transactions of the Japan Society for Aeronautical and Space Sciences*, submitted for publication.
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- (62) **A. Z. Al-Garni**, “A Comparable Aerospace Engineering Program,” *The International Journal of Mechanical Engineering Education*, submitted for publication.
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**(b) Refereed Conferences**

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- (66) J. S. Nizami, and **A. Z. Al-Garni**, “Optimization of aerospace Plane Trajectories to

- Minimize Heat Load Using a Neural Controller,” The International Association of Science and Technology for Development (IASTED) - *International Conference on Applied Modeling and Simulation*, Lugano, Switzerland, June 20-22, 1994 (1414H).
- (67) **A. Z. Al-Garni**, S. M. Zubair, and J. S. Nizami, “Modeling Electric Energy Consumption in Eastern Province of Saudi Arabia,” *The Second Saudi Symposium on Energy, Utilization and Conservation*, KFUPM, Dhahran, Saudi Arabia, November 1994 (1415H)
- (68) B. S. Yilbas, **A. Z. Al-Garni**, and A. Z. Sahin, “Study into a Small Scale Water Driven Domestic Heat Pump Design Performance Analysis,” *The Second Saudi Symposium on Energy, Utilization and Conservation*, KFUPM, Dhahran, Saudi Arabia, November 1994 (1415H).
- (69) **A. Z. Al-Garni**, A. Z. Sahin, and B. S. Yilbas, “Heat Minimization on an Aerospace Plane,” *The First Symposium on Aerospace and Advanced Technologies*, Istanbul Technical University, Istanbul, Turkey, March 8-10, 1995 (1415H).
- (70) B. S. Yilbas, M. Sami, A. Z. Sahin, **A. Z. Al-Garni**, and A. Coban, “Heat Transfer Mechanisms in Relation to Laser Surface Melting of Nitraded Steel,” *Proceedings of the Third International Conference on Advanced Computational Methods in Heat Transfer, Heat Transfer '94*, Southampton, U. K., August 22-24, 1994, pp.201-208 (1415H).
- (71) **A. Z. Al-Garni**, A. Z. Sahin, B. S. Yilbas, and S. A. Ahmed, "Active Cooling of Aerospace Plane Using H<sub>2</sub>, CH<sub>4</sub> and Xe (1995)," *AIAA - Atmospheric Flight Mechanics Conference*, Baltimore, Maryland, U. S. A. AIAA-95-3475, August 7-9, 1995, pp.435-442 (1416H).
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- (73) **A. Z. Al-Garni**, “Heat Minimization on an Aerospace Plane,” *Presented at the First KFUPM Mini-Symposium on Optimization Theory and Applications*, May 30, 1995 (1415H).
- (74) **A. Z. Al-Garni**, A. Z. Sahin, B. S. Yilbas, and S. A. Ahmed, “Comparison of Hydrogen and Methane for Cooling Hypersonic Aerospace Plane,” *The Joint ASME/JSME Fluid Engineering Conference*, Hilton Head, South Carolina, U.S.A., August 13-18, 1995 (1416H).
- (75) **A. Z. Al-Garni**, “The Need for Full Aerospace Engineering Program,” *The Fourth Saudi Engineering Conference*, KAU, Jeddah, Saudi Arabia, Vol. I, November 5-8, 1995, pp.119-124 (1416H).
- (76) **A. Z. Al-Garni**, A. K. Sheikh, and M. A. Bader, “Failure Statistics of Airplane Tires and a Reliability-Based Forecasting Strategies,” *The Fourth Saudi Engineering Conference*,



- KAU, Jeddah, Saudi Arabia, Vol. IV, November 5-8, 1995, pp.463-469 (1416H).
- (77) **A. Z. Al-Garni**, Y. N. Al-Nassar, S. M. Zubair, and J. S. Nizami, "On Regression Modeling of Electric-Consumption Data in Eastern Province," *The Fourth Saudi Engineering Conference*, KAU, Jeddah, Saudi Arabia, Vol. V, November 5-8, 1995, pp.361-367 (1416H).
- (78) **A. Z. Al-Garni**, "The Aerospace Plane," *The International Airline Industry Conference*, Jeddah, Saudi Arabia, Track-2, November 21-23, 1995 (1416H).
- (79) **A. Z. Al-Garni**, and A. Z. Sahin, "Brake Reliability Analysis for Fokker F-27 Airplane," *AIAA/ASME/ASCE/AHS/ASC 38<sup>th</sup> Structures, Structural Dynamics, and Materials Conference*, Kissimmee, Florida, U.S.A., AIAA-97-1105, April 7-10, 1997 (1416H).
- (80) A. Z. Sahin, and **A. Z. Al-Garni**, "Transient Temperature Analysis of Airplane Carbon Composite Disk Brakes," *32<sup>nd</sup> AIAA-Thermo physics Conference*, Atlanta, Georgia, U.S.A., AIAA-97-2491, June 23-25, 1997 (1418H).
- (81) **A. Z. Al-Garni**, A. Z. Sahin, and A. M. Al-Qutub, "Cooling Aerospace Plane Using Hydrogen Ammonia and Krypton," *32<sup>nd</sup> AIAA-Thermo physics Conference*, Atlanta, Georgia, U.S.A., AIAA-97-2491, June 23-25, 1997 (1418H).
- (82) **A. Z. Al-Garni**, "Aerospace Engineering at King Fahd University of Petroleum & Minerals," *The Fourth Asia-Pacific Conference on Multilateral Cooperation in Space Technology and Applications*, University of Bahrain, Bahrain, December 1-4, 1997, (On the basis of abstract reviews.) (1418H)
- (83) Y. N. Al-Nassar, M. Siddique, and **A. Z. Al-Garni**, "Modeling Vibration Control of Rotor Bearing Systems Using Neural Networks," *The Fifth Saudi Engineering Conference*, Umm Al-Qura University, Makkah Al-Mukaramah, Saudi Arabia, February, 1999 (1419H).
- (84) A. Z. Sahin, and **A. Z. Al-Garni**, "Thermal Analysis of Airplane Composite Disk Brake Systems," *The Fifth Saudi Engineering Conference*, Umm Al-Qura University, Makkah Al-Mukaramah, Saudi Arabia, February, 1999 (1419H).
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- (86) **A. Z. Al-Garni**, A. M. Al-Garni, S. A. Ahmed, and A. Z. Sahin, "An Experimental investigation of an Airfoil with a Leading-Edge Rotating Cylinder for Boundary-Layer Control," *Workshop on Energy Conservation in Industrial Applications*, WEC 2000, Dhahran, Saudi Arabia, February 12-14, 2000, pp.423-427 (1420H).
- (87) **A. Z. Al-Garni**, "Optimal control of aerospace plane", *Al-Azhar engineering 7<sup>th</sup> international conference*, April 2003 (1424H).

- (88) A. Z. Sahin and **A. Al-Garni**, “Environmental impact assessment of hydrogen use”, Accepted by *The World renewable energy congress VII*, Cologne, Germany, 29 June-05 July, 2003 (1423H).
- (89) A. Z. Sahin and **A. Al-Garni**, “Environmental, safety, Efficiency, Versatility and economic aspects of hydrogen energy utilization”, Invited paper for publication on a book by *renewable energy* 2003, UK, Dec 2003 (1423H).
- (90) **A. Z. Al-Garni**, M. Tozan, A. Kassem and S. Farooq, “Reliability Analysis of Aircraft Air Conditioning Packs”, *3<sup>rd</sup> Aircraft Engineering Symposium*, Jeddah, Saudi Arabia, Nov 2004 (1425H).
- (91) **A. Z. Al-Garni**, M. Tozan, A. M. Al-Garni, and A. Jamal, “Failure Data Analysis for Aircraft Maintenance Planning”, *3<sup>rd</sup> Aircraft Engineering Symposium*, Jeddah, Saudi Arabia, Nov 2004 (1425H).
- (92) **A. Z. Al-Garni**, M. Tozan, A. Maqsood, A. M. Al-Garni, and A. Jamal, “Comparison Between Neural Network and Weibull Models for Failure Rate of De Havilland Dash-8 Tires”, *3<sup>rd</sup> Aircraft Engineering Symposium*, Jeddah, Saudi Arabia, Nov 2004 (1425H).
- (93) F. Saeed, **A. Z. Al-Garni**, A. Jamal, and M. Tozan “Computational Simulation of 65-Degree Delta Wing with Spanwise Suction”, *43<sup>rd</sup> AIAA Aerospace Science Meeting and Exhibit*, Reno, Nevada, USA, Jan 10-13, 2005 (1426H).
- (94) **A. Z. Al-Garni**, and Ayman H. Kassem, “Optimizing Aerospace plane Ascent Trajectory with Thermal Constraints Using Genetic Algorithms ”, *AIAA/CIRA 13<sup>th</sup> International Space Planes and Hypersonic Systems and Technologies Conference*, Capua, Italy, May 16-20, 2005 (1426H).
- (95) F. Saeed, and **A. Z. Al-Garni**, “Impact of Floating-Point Arithmetic on Engineering Numerical Analysis”, *30<sup>th</sup> Annual ARA Congress*, Chisinau, Republic of Moldova, July 2005 (1426H).
- (96) **A. Z. Al-Garni**, F. Saeed, and A. M. Al-Garni, “Experimental and Numerical Investigation of 65-deg Delta and 65/40-deg Double-Delta Wings”, AIA Paper 2006-0063, *44<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit*, Reno. Nevada, USA, Jan. 2006 (1426H).
- (97) F. Saeed, and **A. Z. Al-Garni**, “An Analysis Method for Inertial Particle Separator”, AIAA Paper 2006-0014, *44<sup>th</sup> AIAA Aerospace Science Meeting and Exhibit*, Reno. Nevada, USA, 9-12 Jan. 2006 (1426H).
- (98) Saeed, F., and **A. Z. Al-Garni**, ”Numerical Simulation of Surface Heat Transfer from an Array of Hot Air Jets,” presented at *the 25<sup>th</sup> AIAA Applied Aerodynamics Conference*, Miami, Florida, USA, June 25-28, 2007 (1428H).
- (99) **A. Z. Al-Garni**, M. Shafiq, A. Kassem, and R. Irfan, ”Freed Forward Adaptive Learning Based Tracking of Spacecraft Attitude,” *the 15<sup>th</sup> Mediterranean Conference*, Greece, June

2007 (1428H).

- (100) **A. Z. Al-Garni**, A. Kassem, and B. Siddiqui, “Scale Factors for Linearization Gain – Scheduled Missile Autopilot,” *European Control Conference 2007*, Kos, Greece, July 2-5, 2007 (1428H).
- (101) **A. Z. Al-Garni**, R. Irfan, R. Doraiswami, and A. Kassem, “Internal Model Control Based Adaptive Attitude Tracking,” *Workshop on Robot Motion & Control ROMOCO’07*, Poznan University, Poland, June 2007 (1428H).
- (102) **A. Z. Al-Garni**, A. Kassem, and R. Irfan, “Spacecraft Attitude Control Using Internal Model Principle,” *the 4<sup>th</sup> GCC – IEEE Conference*, K. of Bahrain, Nov. 2007 (1428H).
- (103) **A. Z. Al-Garni**, and W.G. Abdelrahman, “A Wave Dispersion Model for Health Monitoring of Plates with Piezoelectric Coupling in Aerospace Applications,” *the 4<sup>th</sup> Middle East Nondestructive Testing Conference & Exhibition 2007*, K. of Bahrain, Dec 2-5, 2007 (1428H).
- (104) **A. Z. Al-Garni**, A. Jamal, and I. M. Mehedi, “Failure Forecasting for Cost Effective Planned Replacement of Boeing 737 Brakes Employing Neural Network,” *The Opportunity & Challenges Facing the Gulf Aviation Industry*, Dhahran, K.S.A., Nov 6-7, 2007 (1428H).
- (105) Khan M. M. A, Saeed. Farooq and **A. Z. Al-Garni**, “Numerical Investigation of Mechanism to Aid in Enhancing Surface Heat Transfer from an Impinging 2D Hot Air Jet”, *13<sup>th</sup> CASI Aeronautics Conference and 56<sup>th</sup> Annual General meeting*, Ottawa, Canada, April 5-7, 2009 (1431H).
- (106) Ayman H. Kassem, **A. Z. Al-Garni**, and Bilal A. Siddiqui, “Using USAF DATCOM to Predict Non-Linear Aerodynamics of Structurally Impaired aircraft”, *AIAA Atmospheric Flight Mechanics Conference*, AIAA 2009-6047, Chicago, Illinois, USA, Aug 10-13, 2009 (1431H).
- (107) Saeed Farooq, **A. Z. Al-Garni**, and Khan M. M. A, “Numerical Investigation of Mechanism for Anti-Icing Hot-Air Jet Surface Heat Transfer Enhancement”, *10<sup>th</sup> AIAA/ASME Joint Thermo physics and Heat Transfer Conference*, AIAA 2010-4770, Chicago, Illinois, USA, 28 June – 1 July, 2010 (1431H).
- (108) **A. Z. Al-Garni** and Saeed Farooq, “Experimental & Numerical investigation of 65-deg Delta and 65/40-deg Double Delta Wings in Sideship”, *28<sup>th</sup> AIAA Applied Aerodynamics Conference*, AIAA 2010-4950 Chicago, Illinois, USA, 28 June – 1 July, 2010 (1431H).
- (109) **A. Z. Al-Garni** and Dr. Wael G. Abdelrahman “Saudi International Space & Aeronautics Technology Conference” King Abdulaziz City for Science & Technology (KACST), Riyadh, Oct 2 – Oct 3, 2010 (1431H).

(c) **Reports and Dissertation**

- **A. Z. Al-Garni**, Principal Investigator, A. M. Al-Garni, “Aerodynamic Performance and Longitudinal Stability Analyses of delta and Double-Delta Wing Configurations”, Report # 1, KFUPM Fast Track Project FT-2004/08, June 2005.
- **A. Z. Al-Garni**, Principal Investigator, A. M. Al-Garni, “Aerodynamic Performance and Longitudinal Stability Analyses of delta and Double-Delta Wing Configurations”, Final Report of 1, KFUPM Fast Track Project FT-2004/08, May 2006 (*1427H*).
- Saeed, F., **A. Z. Al-Garni**, Co-Investigator, “Numerical Modeling and Analysis of an 2005/04, Report # 1 of 2, May 2006 (*1427H*).
- **A. Z. Al-Garni**, “Vortex Modeling of the Discrete Winds Encountered in Severe Clean-Air Turbulence,” Master Report, University of Arizona (Tucson), September (1983) (*1404H*).
- **A. Z. Al-Garni**, “Optimal Trajectories in Flight Dynamics,” Master Report, University of Michigan (Ann Arbor), August (1987) (*1407H*).
- **A. Z. Al-Garni**, “Performance and Control of Ascending Trajectories to Minimize Heat Load for Transatmospheric Aerospace Planes,” Ph.D. Dissertation, University of Maryland (College Park), August (1991) (*1412H*).
- B. S. Yilbas, A. Z. Sahin, **A. Z. Al-Garni**, S. A. M. Said, Z. Ahmad, and M. Sami, “Surface Treatment of a Ti-Alloy Laser Surface Melting,” Funded Research Project # ME/SURFTREAT/157, Proposal Report, KFUPM, June (1993) (*1413H*).
- B. S. Yilbas, A. Z. Sahin, **A. Z. Al-Garni**, S. A. M. Said, Z. Ahmad, and M. Sami, “Surface Treatment of a Ti-Alloy Laser Surface Melting,” Funded Research Project # ME/SURFTREAT/157, Report # 1, KFUPM, December (1993) (*1414H*).
- B. S. Yilbas, A. Z. Sahin, **A. Z. Al-Garni**, S. A. M. Said, Z. Ahmad, and M. Sami, “Surface Treatment of a Ti-Alloy Laser Surface Melting,” Funded Research Project # ME/SURFTREAT/157, Report # 2, KFUPM, July (1994) (*1414H*).
- B. S. Yilbas, A. Z. Sahin, **A. Z. Al-Garni**, S. A. M. Said, Z. Ahmad, and M. Sami, “Surface Treatment of a Ti-Alloy Laser Surface Melting,” Funded Research Project # ME/SURFTREAT/157, Report # 3, KFUPM, January (1995) (*1415H*).
- B. S. Yilbas, A. Z. Sahin, **A. Z. Al-Garni**, S. A. M. Said, Z. Ahmad, and M. Sami, “Surface Treatment of a Ti-Alloy Laser Surface Melting,” Funded Research Project # ME/SURFTREAT/157, Final Report, KFUPM, July (1996) (*1416H*).
- S. A. Ahmed, **A. Z. Al-Garni**, B. S. Yilbas, and H. I. Abualhamayel, “An Experimental Investigation of Unsteady Flow in the Vaneless Diffusers of Radial Flow Compressors and Blowers,” Funded Research Project # ME/RADIALFLOW/181, Proposal Report, KFUPM, November (1994) (*1415H*).

- S. A. Ahmed, **A. Z. Al-Garni**, B. S. Yilbas, and H. I. Abualhamayel, “An Experimental Investigation of Unsteady Flow in the Vaneless Diffusers of Radial Flow Compressors and Blowers,” Funded Research Project # ME/RADIALFLOW/181, Report # 1, KFUPM, August (1997) (*1417H*).
- S. A. Ahmed, **A. Z. Al-Garni**, B. S. Yilbas, and H. I. Abualhamayel, “An Experimental Investigation of Unsteady Flow in the Vaneless Diffusers of Radial Flow Compressors and Blowers,” Funded Research Project # ME/RADIALFLOW/181, Report # 2, KFUPM, April (1998) (*1418H*).
- S. A. Ahmed, **A. Z. Al-Garni**, B. S. Yilbas, and H. I. Abualhamayel, “An Experimental Investigation of Unsteady Flow in the Vaneless Diffusers of Radial Flow Compressors and Blowers,” Funded Research Project # ME/RADIALFLOW/181, Report # 3, KFUPM, August (1998) (*1419H*).
- S. A. Ahmed, **A. Z. Al-Garni**, B. S. Yilbas, and H. I. Abualhamayel, “An Experimental Investigation of Unsteady Flow in the Vaneless Diffusers of Radial Flow Compressors and Blowers,” Funded Research Project # ME/RADIALFLOW/181, Report # 4, KFUPM, March (1999) (*1419H*).
- **A. Z. Al-Garni**, F. Saeed and A. M. Al-Garni, “Aerodynamic Performance and Longitudinal Stability Analyses of Delta and Double-Delta Wing Configurations,” Final Report KFUPM Project No. FT—204-08, May 2005 (*1426H*).
- **A. Z. Al-Garni**, and W.G. Abdelrahman, “Dictionary of Aerospace Engineering and Sciences Terms,” **Arabic Book Writing Proposal**, submitted to DSR, KFUPM, approved May 2007 (*1428H*).

**(d) Funded Research Projects**

- **Al-Garni**, Principal Investigator, “Aerodynamic performance and longitudinal stability, analysis of delta and double delta wing configurations”. Project No. FT/2004-08 (KFUPM), Sept. 2004 – Sept. 2005
- **Al-Garni**, Principal Investigator, “An experimental investigation of a leading rotation for aircraft operation at high incidence”. Approved by KFUPM 2002 (*1423H*).
- **Al-Garni**, Principal Investigator, “Optimal control for Aerospace plane using closed-form and numerical solutions”. Applied to KFUPM, 2003 (*1423H*).
- **Al-Garni**, Principal Investigator, “An experimental investigation of a 65 degree double-delta wing with different pitching rates”. Applied to KACST, 2003 (*1424H*).
- **Al-Garni**, Co-investigator in the project # ME/SURFTREAT/157, “Surface treatment of a TI alloy by Laser surface melting”. Funded by KFUPM, for 3 years starting July, 1993 (*1413H*).

- **Al-Garni**, Co-investigator in the project “An experimental investigation of unsteady flow in the vaneless diffusers of radial flow compressors and blowers”. Proposed to KFUPM for 3 years starting July, 1996 (*1406H*).
- **Al-Garni**, Co-investigator, “Numerical Modeling and Investigation of Novel Design Arrangements for Improving Surface Heat From an Aircraft Hot-Air Anti-Icing System,” Project No. SB070026 (KFUPM), May 2007 – April
- **Al-Garni**, Principal Investigator, “Aerodynamic Performance and Lateral Stability Analyses of Delta and Double-Delta Wing Configurations,” Project No. FT070012 (KFUPM), Sept. 2007 – Jan. 2010.
- **Al-Garni**, Co-investigator, “Development of a Design Method for Inertial or Sand Particle Separator,” Project No. SB080035 (KFUPM), Sept. 2008 – Feb. 2010.

(e) **Books/Manuals**

- **A. Z. Al-Garni**, *Science and Faith in Flight and Space*, Dar-Al-Sharif for Publication and Distribution, Riyadh, 1998 (*1418H*). (Book in Arabic) (The **first** book of its kind)
- **A. Z. Al-Garni**, *From Desert Camel to Space Flight*, Al-Homaidhi Printing Press, Riyadh, 2000 (*1420H*). (Book in Arabic). Reviewed by higher qualified persons from the Ministry of Information, as well as the Ministry of Defense & Aviation, the **first** book to cover Flight and Aviation history for civil aviation, air forces, aerospace education and scientific establishments in K.S.A.
- **A. Z. Al-Garni**, Ayman Kaseem, Muhammad Shafiq, and Rihan Ahmad, Lecture notes (**Chapters in a book**) in control and Information Sciences: *Robot Motion and control 2007*, Vol 360, 2007 (*1428H*).
- **A. Z. Al-Garni** and W. G. Abdulrehman, “الكوكب الوضاء في الطيران والفضاء”, A book under publication by Obaikan Research and Development, 2010 (*1431H*)
- Others: (Prepared **11** small Books/Manuals).
  - Prepared **Four** small books for the Royal Saudi Air Force (RSAF), to teach *Aerodynamics Math/Physics*, *Pup-up’s*, and *Delivery Analysis*, RSAF, 1984. (Classified), by **A. Z. Al-Garni** (*1404H*).
  - Prepared **two** Laboratory Manuals for AE option courses - ME 426 (*Flight Mechanics*), and ME 433 (*Introduction to Aerodynamics*), KFUPM, 1993. (Unpublished), by **A. Z. Al-Garni**, and M. Tozan (*1413H*).
  - Prepared **three** Laboratory Manuals for AE program – AE-420 (*Aerospace Lab I*), 2002 (*1423H*) & AE 421 (*Aerospace Lab II*), 2003 (*1424H*), AE-450 Computational Method Lab) 2005 (*1426H*) by **A. Z. Al-Garni**.

- Prepared **two** Laboratory Manuals for AE Program, AE 401 (**Aerospace System Maintenance**) 2006 (*1427H*) and AE 402 **Aerospace Avionics**) 2007 (*1428H*), by **A. Z. Al-Garni** and M. Tozan.

**(f) M.S. and Ph.D. Supervision**

Participated in over **10** M.S. and Ph.D. dissertations as advisor / committee member.

**(g) Work Reviewed and consultation**

- Reviewed many publications for leading journals and conferences, (e.g., **AIAA** – top in AE field; **ASME** – top in ME field).
- Gave many consultations for various industries in the Kingdom, (e.g., **Royal Saudi Air Forces, Civil Aviation, King Abdulaziz City of Sciences & Technology (KACST), The Saudi Arm Forces, Private Companies, and others**).

**(h) Patent/Invention**

- US Patent, **US006622973B2 “Movable Surface Plane”** on wing, the invention is related to the control of airfoils and wings, which can be used in the control aircraft, missiles, spacecraft, submarine, and other applications.(supported by KFUPM and approved by U.S. Patent and Trademark Office-PTO) No. 6622973 issued Sept. 23, 2003 (*1424H*).
- US Patent, **US0066955215B2 “Hybrid Cooling System and Method for Cooling Electronic Devices”** Accepted by KFUPM & US patent office, 2006 (*1427H*).
- US Patent, **US007168387B1“A Submarine for Water Purification, Filtration and Environmental Study”**, submitted to KFUPM & US patent office, 2004 (*1425H*).
- US Patent, **US007771508B2 “Wind-Solar Desalination Farm and Park”**, Issued by KFUPM & US patent office, 2010 (*1431H*).
- US Patent, **US20080078670A1 “Double Action Solar Distiller”**, Allowed by KFUPM & US patent office, 2010 (*1431H*)
- US Patent, **US20080041083A1 “A Low Cost Air Conditioning System for Open Area”**, submitted to KFUPM, 2004 (*1425H*).

**(i) Representative workshops and meetings**

- **A. Z. Al-Garni**, "2<sup>nd</sup> Workshop on Engineering Design," KFUPM, Dhahran, K.S.A., April 19, 2009 (*1430H*).

- **A. Z. Al-Garni**, "Aerospace Strategic Plan Forum," KACST, Riyadh, K.S.A., April 21-22, 2009 (1430H).
- **A. Z. Al-Garni**, "Workshop on Developing Academic Leadership," KFUPM, Dhahran, K.S.A., May 5-6, 2009 (1430H).

### **Committees and Other Activities**

- Served as committee member in several engineering and scientific **conferences** and served in over **100** committees as chairman/member during the last 15 years.
- **Associate Editor** for "The Journal of Engineering Research" Sultan Qaboos University, 2003 (1424H) - Now.
- **Associate Editor** for the Journal "International Review of Aerospace Engineering" 2008 (1429H) - Now.
- Chosen to be the **Editor-in-Chief** for AE World e-Journal, 2008 (1429H).
- Among other activities, wrote many **articles** for trade journals and magazines.
- Gave many **seminars** and presentations.
- Participated in **T.V. and Radio** programs inside and outside KSA.