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A DESIGN,ANALYSIS & DEVELOPMENT OF MAHARISHI BHARDWAJA'S VAIMANIKA SHASTRA

[1]Moeen Shaikh, [2]Shreyash Patil, [3]Chinmay Kate, [4]Vatsal Raghwani

[1,2,3,4] Department of Mechanical Engineering, SKN Collage of Engineering, Pune, Maharashtra

ABSTRACT

Maharshi Bharadwaja's Vaimanika Shastra lists four types of Vimanas: Rukma Vimana, Sundra Vimana, Shakuna Vimana, and Tripura Vimana. While Rukma and Sundra Vimanas are categorized as rockets, Shakuna and Tripura Vimanas are categorized as aircraft. As designing and analyzing a rocket requires considering various parameters related to space, Rukma and Sundra Vimanas were eliminated, and Shakuna and Tripura Vimanas were chosen for design and analysis. Using CAD software, the shapes and designsof Shakuna and Tripura Vimanas were created. However, due to the complexity of design parameters, Shakuna Vimana was eliminated.The primary aim was to analyze whether the designed Vimana could produce the required lift or drag, and ANSYS software was used for flow analysis. As a result, it was found that the designed Tripura Vimana was capable of producing the required lift. To further testthe flow analysis, a 3D model of the designed Tripura Vimana was produced using PLA material in a Wol 3D machine. In the next stage, the Tripura Vimana will be passed through a wind tunnel for experimentation. In summary, the paper discusses Vimanas and the successful design and analysis of the Tripura Vimana. Rukma and Sundra Vimanas were eliminated due to their rocket classification, and Shakuna Vimana was eliminated due to complex design parameters. ANSYS software was used to determine that thedesigned Tripura Vimana was capable of producing the required lift, and a 3D model was created for further experimentation in a windtunnel.

KEYWORDS: Vaimanika Shastra, Tripura Vimana, Land, Sea and Sky, Trinetra Loha,

A. Intoduction

Maharshi Bharadwaja, a revered sage in ancient Indian culture, wrote the YantraSarvasva, a great literary work that deals with the science of aeronautics. In the fortieth chapter of the YantraSarvasva, Maharshi Bharadwaja explains the construction and use of various aeroplanes in eight chapters that contain 100 subject heads comprising 500 sutras or oracular pronouncements. The section on Vimanas or the science of aeronauticsin the Vaimanika Shastra, which is part of the YantraSarvasva, provides a manual for design, material selection, manufacture, operation, spacesuits, food, tackling enemies, and becoming invisible. This work consists of nearly 6000 lines or 3000 verses of lucid Sanskrit that clearly depictthe technical details. Some shlokas in the Vaimanika Shastra deal with the qualifications and training of pilots to man these aircraft. Ancient Indian culture, which dates back to 7000 years ago, knew how to create Vimanas that could traverse the sky and beyond using a technology thatNASA is still trying to harness today. The sources mentioned from Vedic texts such as Rig Veda, Yajur Veda, Srimad Bhagavatham, Ramayana, Mahabharatha, Vaimanika Shastra, and Samarangana Suthtradhara cite Vimanas that fly in air, water, and land. They mention various propulsion systems, including Mercury propulsion. Shivkar Bapu Talpade, a Sanskrit scholar, designed and constructed an aircraft based on Vedic principles and demonstrated the first unmanned flight in 1895, eight years before the Wright brothers' first manned flight in 1903. The Vimana shasthra classified the Vimanas into three types depending upon the Yugas: Maantrika, Taantrika, and Kritaka. Our ancestors had such intelligent advanced technology, but how? The Yugas in the Vimana shasthra mentioned that the first humans were able to fly themselves without any machine, and the later humans started facing difficulty and had to use mantras, and the next humans had to use machines. Investigating these facts, it is clear that there is spiritual knowledge consideration and the usage of the brain. Ancient ancestors used 100% of their brain and couldfly without any machines, but the usage of the brain decreased as generations passed by. The possibility of extraterrestrial influence cannot be ruled out, as there are Archaeological evidences such as caves that describe that the early man was not so intelligent and that the planet was often visited by UFOs. Whatever the possibilities, one thing is clear that modern humans are being protected and guided through Sanskrit texts,which make humans more intelligent and protect nature. Several modern scientists have reinvented various materials, glasses, and devices from Sanskrit texts, indicating the value of these ancient texts. The Sri Maharshi Research Institute of Vedic Technology has also made several inventions related to ancient nano-technology.

B. Objectives

1. To Learn Ancient Indian Science Of Aeronautics. &Developing Model According To Vaimanika-Shastra.
2. Study Of Aerodynamics & Comparison Of Modern Aeronautical Findings & Ancient Sriptures.
3. Study Of Different Vimanas Mentioned & Their Metallurgy.
4. Developing A Prototype.

C. Tripura Vimana

The Tripura Vimana is a unique flying machine consisting of three enclosures, or aavaranas, called "Pura." These enclosures enable the vimanato travel on land, sea, and in the sky by altering its structure. The first part is designed for land travel, the second for travel under and over water,and the third for air travel. By uniting these three parts with keelakas, the vimana can travel in the sky. To make the Tripura Vimana, Trinetra metal, which is made up of Shaakataayana Jyotishmatee loha, kaanta-mitra, vajramukha loha, tankana or borax, trynika, shrapanikaa, maandalika, ruchaka or natron, and mercury, should be used. The resulting metal is unbreakable, weightless, impregnable by water, fire, air, and heat, and indestructible. The metal is used to create the peetha, which can be of any desired size. The peetha should have 80 spots marked on it at intervals of 10 feet for wheeled boats, which are 80 feet long, 3 feet wide, and 5 feet high. The boats are fitted with wheels that have axle rods with fittings to attract electric power. The wheels have spokes and are covered with musheeka up to 4 inches from the edge. The holeswith glass coverings in the wheels are used to fix wires made of somakaanta loha for transmitting power. Electric aaghaata keelakaas and chhidraprasaarana keelakas are fixed in the middle of each wheel. Copper wire pairs are fixed over the chakradronee boats on both sides, and inthe joints of the wheels. By adjusting the necessary keelakas, it is possible to accelerate the speed, restrain the flow of the current, and put a brake on excess speed when going down slopes.

D. Design, Development and Analysis of Tripura Vimana

1. Development of CAD Model

CAD model is first prepared in SOLIDWORKS and is converted in .step format to export it to ANSYS is developed by parametric technology corporation and this is one of the fastest growing solid modeling software. As a parametric featured based solid modeling tool, it not only unites the three dimensional model (3D) parametric features with 2D tools, but also addresses every design through- manufacturing process. The solid modeling tool used here allows us to easily import the standard format files with an amazing compatibility to other software's.

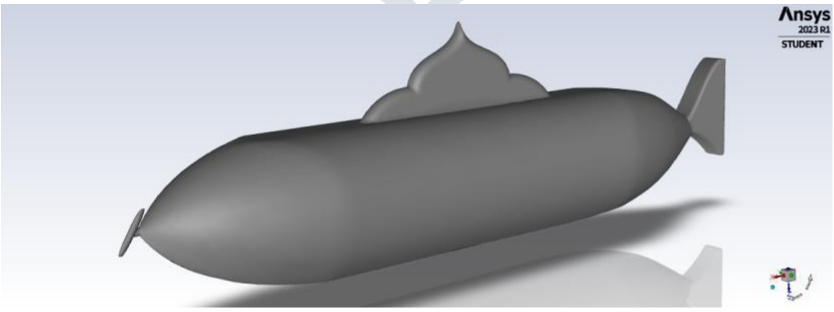

Fig. 1 SolidWorks CAD Model Of Tripura Vimana represented on ANSYS.

2. Boundary Conditions

The conditions at the boundary of the domain need to be set such as inlet velocities, outlets and wall attributes.

3. *Discretization of the Domain*

Since CFD utilizes numerical solutions the domain needs to be discretezised or meshed as it is more commonly referred to. The mesh willhave to be refined in areas with high gradients for example close to the surface around the aircraft model. Initial Values Initial values needto be set for all the nodes in the domain.

4. *Ansys Simulation*

The CAD model is imported in ANSYS CFX and enclosure is created . Using boolean operation continuum is generated the appropriate size and shape of the computational domain, also referred to as control volume, and the best placement of the model in the domain, needs to be determined. A domain too large will make the simulation unnecessarily large and waste computational resources, however a domaintoo small will lower the accuracy of the results. The properties of the domain such as temperature, pressure and fluid properties need to bechosen.

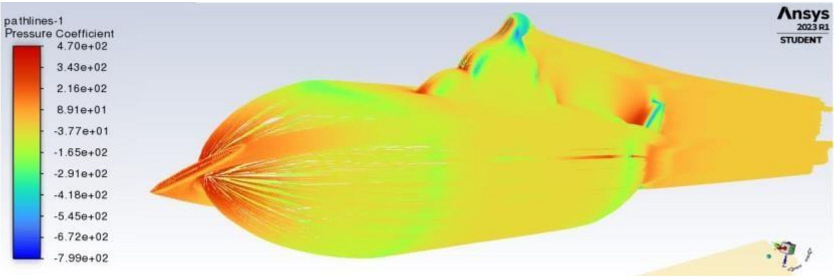

Fig.2 ANSYS Pressure Contour.

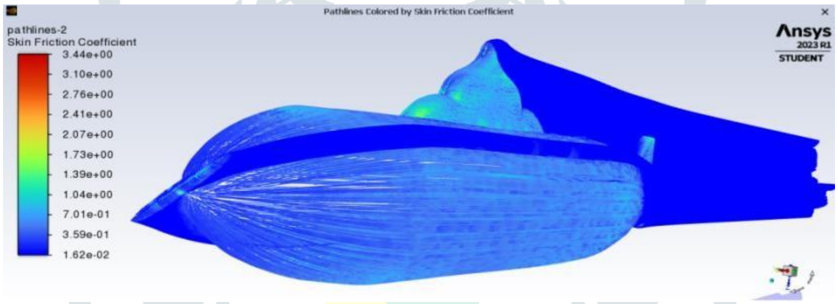

Fig.3 ANSYS Skin Friction Factor.

5. *Post Processing*

The simulation results will give the sums of the forces acting in each direction on the model, or any chosen part of it. Through this, the drag coefficient Cd can be obtained. The amount of lift created by the wing will have to be taken into account in order to be able to calculatethe induced drag. Subtracting the induced drag from the total drag should give the zero lift drag.

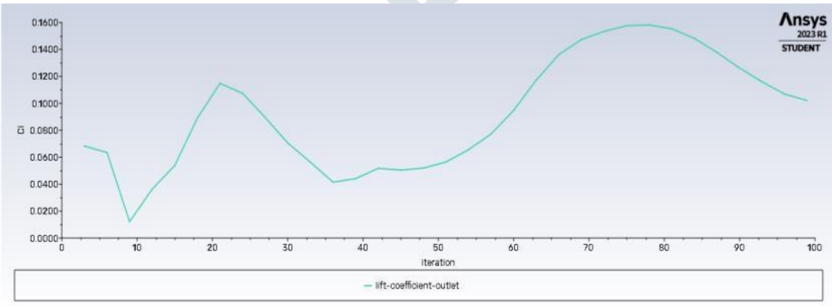

Fig. 4 Lift Coefficient.

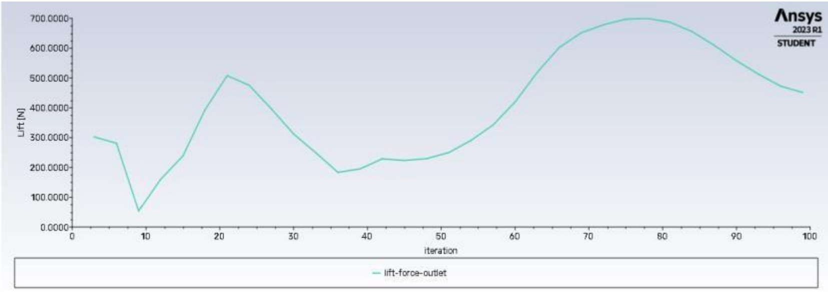

Fig.5 Lift Force.

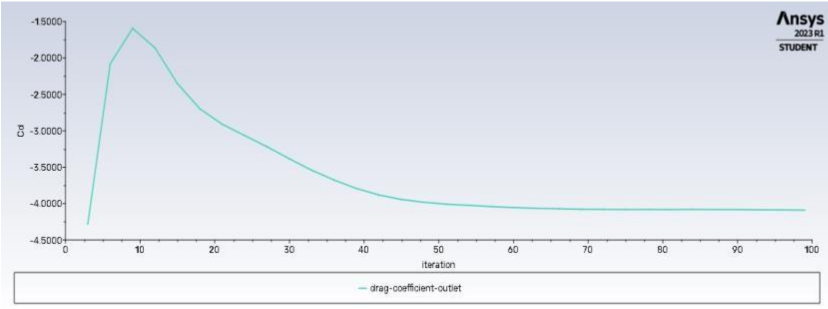

Fig. 6 Drag Coefficient.

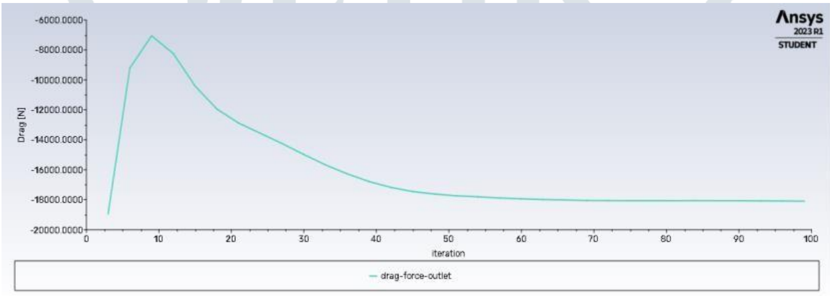

Fig.7 Drag Force.

6. Results And Discussion

We conducted an analysis of our Tripura Vimana design, calculating the lift and drag forces for different pressure conditions. Additionally,we computed the lift coefficient (CL) and drag coefficient (CD) for varying attack angles.

1. Our Tripura Vimana design successfully achieved lift generation and stability during hovering, validating the practicality of ancientVedic texts' knowledge in Vimana design. Wind tunnel experiments will further verify our flow analysis.
2. We observed minimal drag in our design, primarily due to low initial thrust.
3. The velocity magnitude range of our Vimana was between 85m/s to 2000m/s.
4. Our Vimana achieved a Mach range of 3 to 5 without experiencing any wobbling.

E.Experimentation

An experiment is a procedure carried out to support or refute a hypothesis, or determine the efficacy or likelihood of something previously untried. Experiments provide insight into cause-and-effect by demonstrating what outcome occurs when a particular factor is manipulated. Experiments vary greatly in goal and scale but always rely on repeatable procedure and logical analysis of the results. There also exist natural experimental studies.

Fig.8 Experimental Materials.

Fig.9 Experimental Setup.

F. Concluding Remarks and Scope for the Future work

After conducting various experiments in the present day, it is evident that we lack technology when compared to our ancient ancestors. It is becoming increasingly clear that Vedic texts are not merely mythology but historical documents on advanced technologies. The Universal Vedic literatures provide fundamental information for designing, constructing, and flying hovercraft, aircraft, and spacecraft for interplanetary travel. The Vaimanika Shastra and Samarangana Sutradhara offer essential material information necessary for interplanetary travel and re-entry.

We have currently developed a model of the Tripura Vimana using PLA material, but we can explore the use of different materials utilized in the existing design of airplanes to compare their flow parameters. After experimentation, we could proceed to integrate the design extracted from Maharshi Bharadwaja's Vaimanika Shastra and incorporate it into existing airplanes. This would provide us with valuable insights into ancient technological practices and potentially even lead to new advancements in modern aviation.

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