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DESIGN AND ANALYSIS OF SIX BAR MECHANISM USING CATIA V5 AND ADAMS VIEW SOFTWARE

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Abstract: The design and analysis of a Six Bar Mechanism play a crucial role in various engineering applications, from automotive suspension systems to robotic arms. In this study, CATIA V5 and Adams View software are employed to create a comprehensive model of Six Bar Mechanism and perform a thorough analysis by using Adams view software. CATIA V5 is utilized for the initial design phase, allowing for precise 3D modeling and visualization of the six bar mechanism parts. This software facilitates the creation of a virtual prototype, enabling to make necessary adjustments and optimize the design of six bar mechanism before analysis in Adams view software. The CATIA V5 facilitates the conversion of CAD model file of six bar mechanism to stp format. Then stp format of six bar mechanism from CATIA V5 is imported in Adams view software. After importing the CAD model of six bar mechanism from CATIA V5 to Adams view, the Adams View is employed for Kinematic analysis, simulation of the motion and behavior of the Six Bar Mechanism under different operating conditions and Plotting the graphs of six bar mechanism. This combination of Catia V5 and Adams View provides a powerful toolset for the design and analysis of complex mechanical systems, ensuring efficiency, accuracy, and reliability in engineering projects involving Six Bar Mechanisms.

Index Terms **– Six Bar Mechanism, CATIA V5, Adams software, Kinematics analysis, Movement, Simulation.**

I. INTRODUCTION

A six-bar mechanism is a complex mechanical system composed of six interconnected links or bars, each with its own degree of freedom. These mechanisms are a subset of multibody systems and are often used in engineering and robotics to achieve specific motions or tasks. To provide a deep introduction, let's break down the key aspects of a six-bar mechanism. The six-bar mechanism is a fundamental and intricate mechanical system that finds applications in various engineering domains, including robotics, automotive engineering, and industrial machinery. It consists of six interconnected rigid bars or links, with each bar having multiple joints or connections. These connections enable the mechanism to transform input motion or force into a specific output motion, creating a wide range of mechanical motions and functions. The six-bar mechanism is highly versatile, capable of performing tasks such as amplifying or reducing motion, transmitting force, or converting rotary motion into linear motion. Engineers and designers often utilize this mechanism in complex systems, such as vehicle suspension systems, where it helps to absorb shocks and maintain stability. Moreover, its role in robotic arms allows for precise and controlled movements, making it indispensable in manufacturing and automation. Understanding the six bar mechanism requires expertise in kinematics, dynamics, and control theory, as it involves intricate calculations to predict and control the motion of its constituent parts. Researchers and engineers continually explore its potential, seeking innovative ways to harness its capabilities for a myriad of applications. In essence, the six bar mechanism exemplifies the elegance and complexity of mechanical engineering, serving as a cornerstone in the development of advanced machinery and automation systems. CATIA V5 is a renowned computer-aided design (CAD) and computer-aided manufacturing (CAM) software developed by Dassault Systems. It is widely used in the aerospace, automotive, and other industries for designing complex 3D models and engineering solutions. CATIA V5 offers a comprehensive suite of tools for product design, analysis, and simulation, enabling engineers and designers to create, visualize, and validate their designs efficiently. Its user-friendly interface and extensive features make it a popular choice for product development and manufacturing, making it an essential tool for many professionals in the Design field. Here in this paper CATIA V5 is used to design six-bar mechanism. Adams View is a software application commonly used in the field of mechanical engineering and simulation. It is part of the Adams multibody dynamics and Kinematics simulation software suite; it allows the Engineers to model the machine members and analyze the motion and behavior of mechanical systems. Adams View provides a user-friendly interface for creating and visualizing dynamic simulations, making it easier for engineers to understand and optimize the performance of complex mechanical systems, such as vehicles, machinery, and robotics. It plays a crucial role in aiding product design and development by simulating how components interact and move within a system, helping engineers to make design decisions. In this work Adams view is employed to carry out Kinematic analysis and Simulation of six-bar mechanism.

II. LITERATURE REVIEW

Darina Hroncov, Ingrid Delyova. (2020) [1] this paper focuses to compile a two-link model of manipulator and control the basket movement mounted at its end effector, also focuses on simulation of the motion of a two-link manipulator model using MSC Adams. Attention is given to modeling and control of kinematic and dynamic analysis of the manipulator. To design a control system to keep the basket of the end effector in horizontal position, the capabilities of MSC Adams Control ToolKit are used. The results obtained from computer simulation of the model are evaluated. Ahmet Shala and Mirlind Bruqi. (2017) [2] in this paper, the authors have described the kinematic analysis of six-bar mechanism based on vector loops. Here description of vectorial and scalar equations for each simple planar mechanisms, either closed-chain or open chain are essential. Also used dynamic equations of motions for kinetic analysis. Vectorial/scalar equations is done to get the solutions using MathCAD software. The results obtained are verified using working model 2D software. R Marek Moravic Darina Hroncová2, Oskar Ostertag3. (2015) [3] the authors have solved vertical oscillating of mechanical system numerically by kinematic excitation. The simulation is carried out considering a simple solid table as a three-dimensional model of mechanical system without taking gravity impact into consideration using MSC Adams/view. The purpose of the work is to create complex instruction of vertical vibration that is intended for didactic purposes. Alzbeta Sapietova, Vladimír Dekys. (2015) [4] this paper presents the analysis of misalignment of rotating machines using dynamic of systems of bodies MSC ADAMS. The analysis is carried out on different parameters like deflection, velocity and acceleration of virtual models of each type of misalignment. The signs of failure states are presented in frequency spectrums processed by Fourier transformation. Peter Frankovsky et al (2014) [5] this paper emphasizes on kinematic analysis of six-member mechanism. The fundamental kinematic relations are derived for the mechanism to get analytical solution. The simulation modeling is done using MSC ADAMS and comprehensive analysis is carried out with a simple modeling. Ivan Virgala et al 2014) [6]: this paper aims to present the application of MSC Adams/view for kinematic analysis of a press mechanism. The simulation of press mechanism is carried out in MSC Adams/view and results are obtained on parameters like displacement, velocity and acceleration. Darina Hroncova, Michal Binda, Patrik Sarga, Frantisek Kicak. (2012) [7]: the authors have developed a functional model of centric crank mechanism in ADAMS/View software, and carried out a simulation of the mechanism with a set of different parameters to get its kinematical analysis. Finally, the process is compared and evaluated with the data gathered. Kun Lv, Yang Yuan, Dong Guo and Lu Wang. (2012) [8] this paper makes an attempt to describe mathematical movement model of six-bar mechanism of shaper with vector analytic method. The simulation and analysis of the mechanism is carried out using ADAMS and results are compared with theoretical calculations. The performance of the mechanism was analyzed through parameterized modeling, also optimization of the mechanism was realized using ADAMS.

III. STUDY AND DEVELOPMENT OF SIX BAR MECHANISM

The study and development of a six bar mechanism in CATIA V5 software involve a complex process of designing and simulating a mechanical system with six interconnected links. CATIA V5 is a powerful computer-aided design (CAD) software that enables engineers and designers to create, analyze, and visualize intricate mechanical systems. To begin, engineers typically define the objectives and constraints of the six-bar mechanism project, such as the desired motion, force requirements, and spatial limitations. This initial phase includes concept generation and feasibility studies to determine if a six-bar mechanism is the appropriate solution for the intended purpose. Next, the design phase commences, where engineers utilize CATIA V5's robust modeling tools to create 3D representations of each link and their connecting joints. Constraints, such as revolute or prismatic joints, are defined to replicate the actual mechanical behavior accurately. This phase demands precision and attention to detail to ensure the mechanism functions as intended. Once the CAD model is complete, engineers can simulate the six-bar mechanism's motion using CATIA V5's kinematics analysis capabilities. This step allows them to evaluate the system's performance, including velocity, acceleration, and position over time. It's essential for validating the design and making necessary adjustments. Further more, engineers can conduct stress and dynamic analyses within CATIA V5 to assess the structural integrity and durability of the mechanism under varying loads and conditions. This ensures that the design is robust and safe for its intended application. The final stage involves the generation of detailed engineering drawings and documentation for manufacturing. CATIA V5 streamlines this process by providing tools for creating 2D drawings and bill of materials (BOM), ensuring that the design can be fabricated accurately. CATIA V5 is an valuable tool for studying, designing, and developing six-bar mechanisms. It empowers engineers to create precise 3D models, simulate their behavior, and perform comprehensive analyses, ultimately leading to the successful realization of complex mechanical systems.

3.1 PROCEDURE FOR DESIGNING THE SIX BAR MECHANISM BY USING CATIA V5 SOFTWARE

Developing a six-bar mechanism in CATIA V5 involves creating a parametric model with constraints and constraints to define the motion. Here's a simplified overview of the process. Define the purpose and constraints of your six-bar mechanism. Determine the desired input and output motions. Sketch a rough design on paper, including the location of joints and links. Launch CATIA V5 and create a new Assembly or Part file, depending on your preference. Set units and other project-specific settings. Start by sketching the individual components of your six bar mechanism using the Part workbench. Define parameters such as lengths, angles, and positions that will control the motion of the mechanism. You can use the Formula Editor to create parametric relationships. Create separate parts for each of the six links in your mechanism. Use sketches and features like extrusions, revolutions, and sweeps to model the links. Ensure that the joints allow the desired degrees of freedom for your mechanism. Assemble the links together in your assembly workspace. Use constraints to define how the links are connected at their joints. If possible, build a physical prototype of your mechanism to validate its functionality. Create detailed documentation, including drawings and reports, to communicate your design to others. Once satisfied with your design, finalize it and export the necessary files for manufacturing or further use.

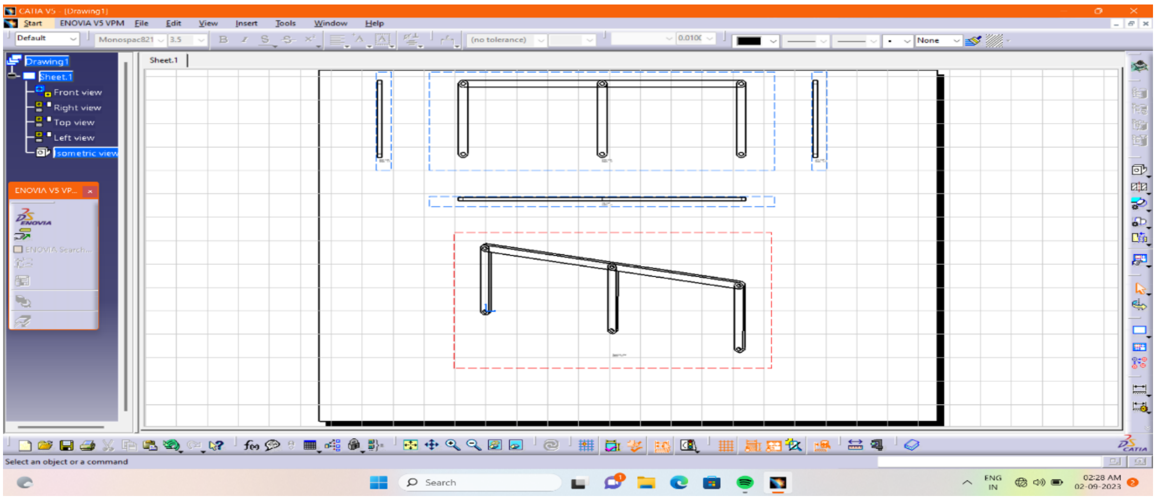


Figure 3.1 Six Bar Linkage Mechanism is drafted in CATIA V5 Software

The above figure 3.1 shows the Drafting of the six bar linkage mechanism has been drawn as per the dimensions in CATIA V5 software, In that CATIA V5 software the front view, top view, right side view, left side view and isometric view of six bar linkage mechanism as been presented.

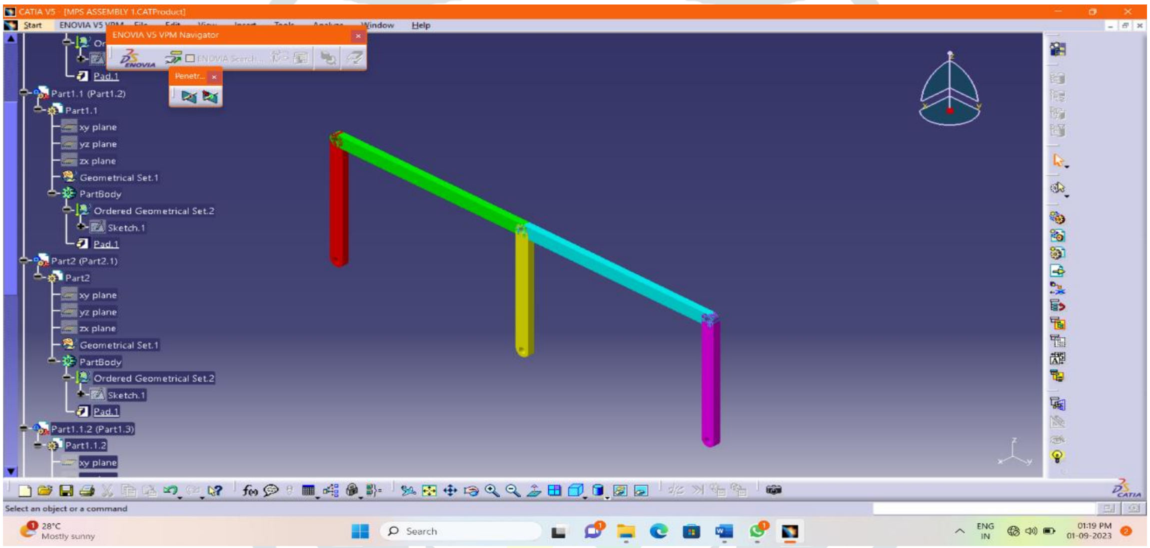


Figure 3.2 Parts 1 to 6 Six Bar Linkage Mechanism Isometric View in CATIA V5 Software

The figure 3.2 shows the design of Parts 1 to 6 of the six bar linkage mechanism has been drawn as per the dimensions in CATIA V5 software and also Parts 1 to 6 of six bar linkage mechanism has been assembled in Assembly of CATIA V5 software, In that Assembly of CATIA V5 software the isometric view of six bar linkage mechanism as been presented.

3.2 ANALYSIS OF SIX BAR MECHANISM USING ADAMS VIEW SOFTWARE

The six-bar mechanism, also known as a six-link mechanism, is a complex mechanical system consisting of six rigid links connected by joints. In Adams View, a software tool commonly used for dynamic analysis of mechanical systems, you can simulate and analyze the behavior of such mechanisms. Here's a general overview of how Adams View might be used to analyze a six-bar mechanism. Start by creating a 3D model of the six-bar mechanism within Adams View. You'll define the rigid links and specify the types of joints connecting them. These joints can include revolute joints, prismatic joints, and others, depending on the specific mechanism you're analyzing. Specify the dimensions, masses, and material properties of the links and any external forces or torques applied to the mechanism. Adams View allows you to perform kinematic analyses to study the motion of the mechanism. You can simulate how the mechanism moves over time, including positions, velocities, and accelerations of various points on the links. This is where Adams View excels. You can simulate the dynamic behavior of the six-bar mechanism under different conditions, such as varying loads, initial conditions, or control inputs. This analysis helps you understand how the mechanism responds to forces and torques and how it may experience issues like vibrations or instability. If your goal is to improve the performance of the six-bar mechanism, Adams View can be used for optimization studies. You can adjust design parameters to optimize factors like speed, force transmission, or energy efficiency. Adams View provides 3D visualizations and animations of the mechanism's behavior, making it easier to understand and communicate the results of your analysis. You can export data and simulation results from Adams View for further analysis or reporting.

3.2.1 PROCEDURE FOR DESIGNING THE SIX BAR LINKAGE MECHANISM BY USING ADAMS VIEW SOFTWARE

Analyzing a six-bar mechanism using Adams View software typically involves several steps. Adams View is a powerful tool for dynamic analysis of mechanical systems. Here's a brief overview of the procedure. Begin by creating a 3D model of the six-bar mechanism in Adams View. You'll need to define the geometry, dimensions, and constraints accurately. Import CAD models if available. Specify the joints and constraints that govern the movement of the mechanism. Ensure that you accurately represent the type of connections between the bars and their degrees of freedom. Specify the desired motion or input parameters for your analysis. You might want to simulate the mechanism's motion under specific conditions or control inputs. Configure the simulation settings, such as time step, solver options, and numerical integration methods. Ensure that the settings are appropriate for your analysis. Execute the simulation in Adams View. The software will compute the dynamic behavior of the six-bar mechanism based on your inputs and constraints. Analyze the results generated by the simulation. Adams View provides various output options, including animations, graphs, and data tables. You can use these outputs to study motion, forces, velocities, and other relevant parameters. Depending on the results, you may need to make adjustments to your model, constraints, or input parameters. Re-run the simulation to refine your analysis. Validate your simulation results by comparing them with experimental data if available. This step ensures that your model accurately represents the real-world behavior of the mechanism. Document your analysis process, including model details, simulation settings, and results. Create reports or presentations to communicate your findings effectively.

3.2.2 IMPORTING OF SIX BAR LINKAGE MECHANISM FROM CATIA V5 TO ADAMS VIEW

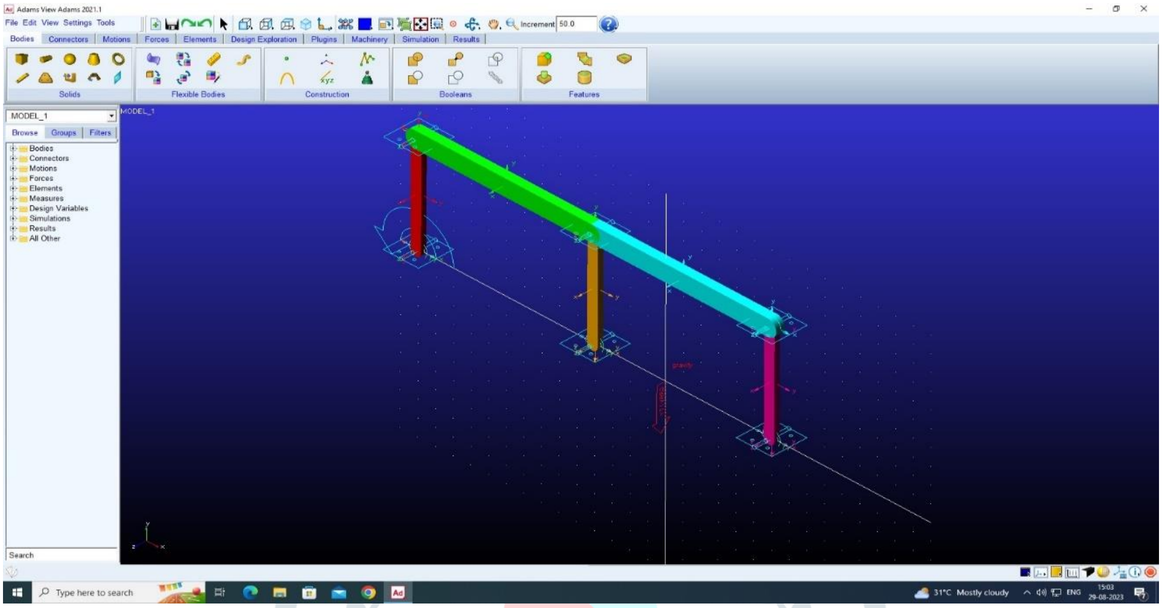


Figure 3.3 Isometric View of Six Bar Linkage Mechanism (Adams Software)

The above figure 3.3 shows the Import of Parts 1 to 6 of six bar linkage mechanism by using stp format from CATIA V5 software as been shown as per the dimensions in Adams software, In that Adams software the isometric view of six bar linkage mechanism as been presented. Finally, after importing of Six Bar Mechanism from CATIA V5 software by using stp format from CATIA V5 software then we have to give the Kinematic motion to the Parts of Six Bar Linkage Mechanism by fixing the ground which is under the Six Bar Mechanism then after that we have to select the Simulation option which is in the Adams View software after that we have to simulate the Six Bar Mechanism then we have to draw the graphs for Parts of Six Bar Mechanism.

3.2.2.1 TABLES AND GRAPHS OF POSITION, VELOCITY, AND ACCELERATION OF PART 2

Table 3.1 Part 2 Position values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm	Y in mm	Z in mm	Mag
0	-700	200	0	700
5	-400	-50	0	650
10	-800	100	0	850
15	-600	0	0	600
20	-800	-10	0	850

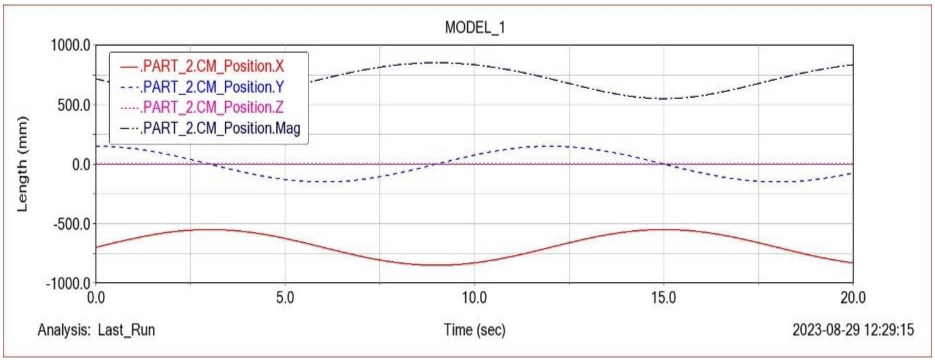


Figure 3.4 Part 2 Position in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.4 shows the Part 2 of six bar linkage mechanism Position in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.2 Part 2 Velocity values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm/sec	Y in mm/sec	Z in mm/sec	Mag
0	80	0	0	80
5	-70	-35	0	80
10	35	70	0	80
15	0	-80	0	80
20	-45	45	0	80

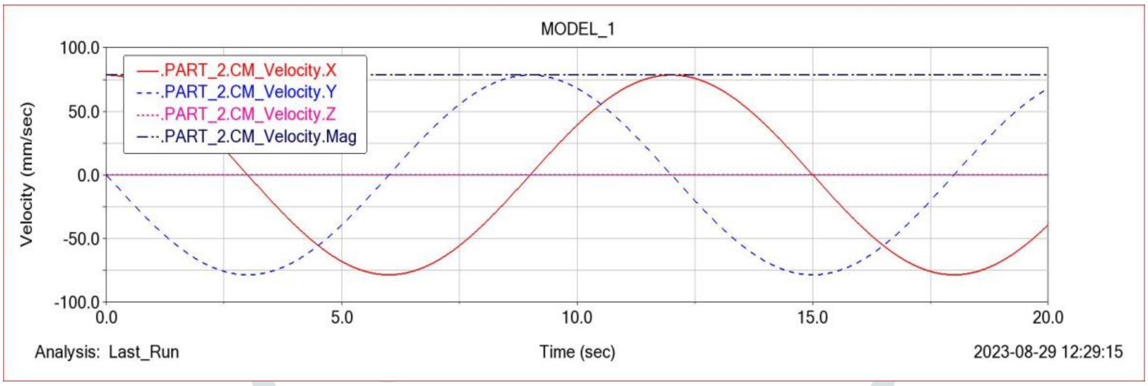


Figure 3.5 Part 2 Velocity in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.5 shows the Part 2 of six bar linkage mechanism Velocity in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.3 Part 2 Acceleration values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm/sec^2	Y in mm/sec^2	Z in mm/sec^2	Mag
0	0	-42	0	42
5	-20	42	0	42
10	35	-20	0	42
15	-42	0	0	42
20	35	20	0	42

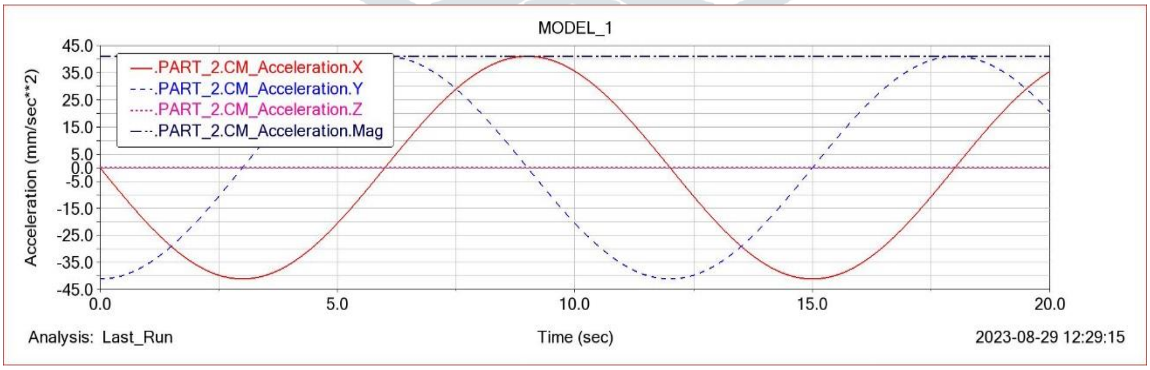


Figure 3.6 Part 2 Acceleration in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.6 shows the Part 2 of six bar linkage mechanism Acceleration in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

3.2.2.2 TABLES AND GRAPHS OF POSITION, VELOCITY, AND ACCELERATION OF PART 3

Table 3.4 Part 3 Position values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm	Y in mm	Z in mm	Mag
0	-450	300	0	550
5	-300	-250	0	400
10	-700	200	0	700
15	-200	0	0	150
20	-700	-200	0	750

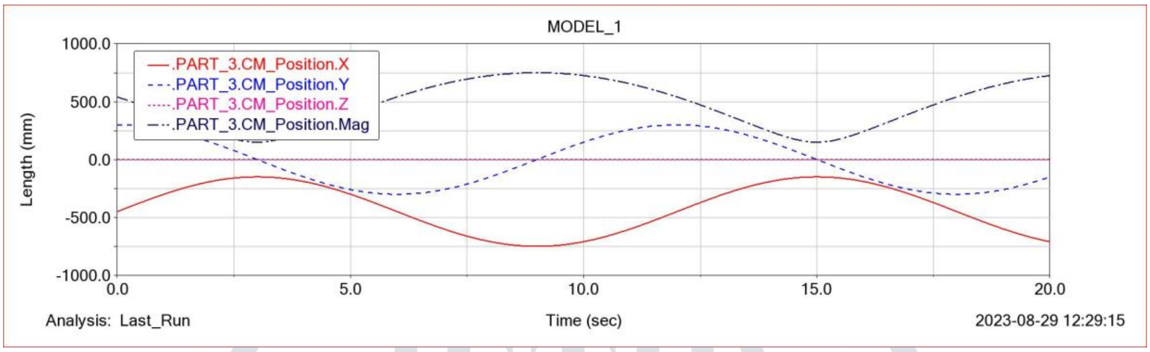


Figure 3.7 Part 3 Position in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.7 shows the Part 3 of six bar linkage mechanism Position in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.5 Part 3 Velocity values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm/sec	Y in mm/sec	Z in mm/sec	Mag
0	160	0	0	160
5	-140	-75	0	160
10	75	140	0	160
15	0	-160	0	160
20	-80	140	0	160

Figure 3.8 Part 3 Velocity in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.8 shows the Part 3 of six bar linkage mechanism Velocity in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.6 Part 3 Acceleration values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm/sec^2	Y in mm/sec^2	Z in mm/sec^2	Mag
0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0
5	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0
10	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0
15	4.0E+08	4.0E+08	4.0E+08	4.0E+08
20	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0

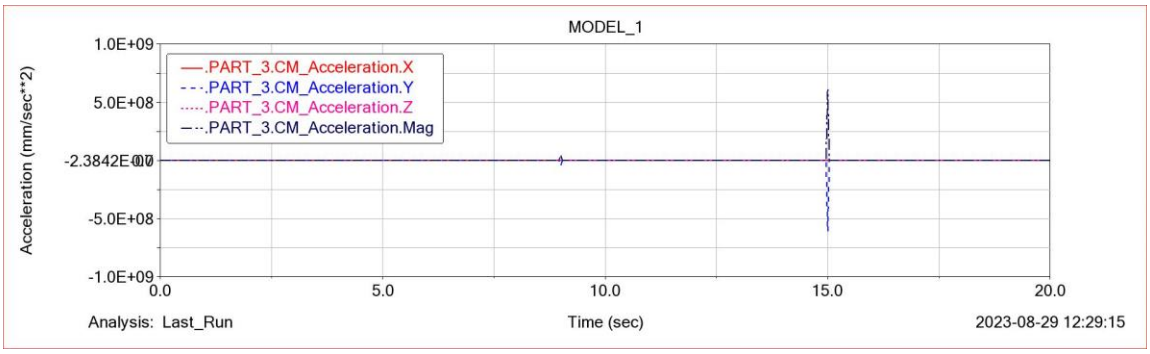


Figure 3.9 Part 3 Acceleration in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.9 the Part 3 of six bar linkage mechanism Acceleration in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

3.2.2.3 TABLES AND GRAPHS OF POSITION, VELOCITY, AND ACCELERATION OF PART 4

Table 3.7 Part 4 Position values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm	Y in mm	Z in mm	Mag
0	-200	150	0	250
5	-125	-125	0	200
10	-325	75	0	340
15	-50	0	0	50
20	-340	-40	0	340

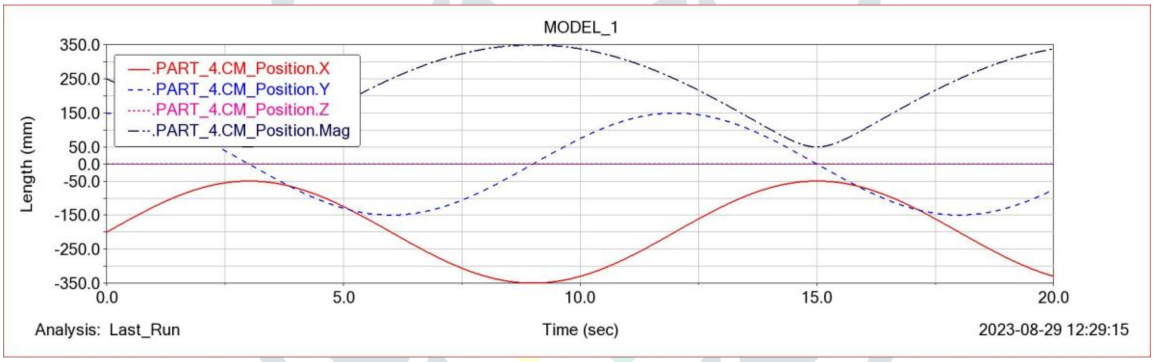


Figure 3.10 Part 4 Position in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.10 shows the Part 4 of six bar linkage mechanism Position in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.8 Part 4 Velocity values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm/sec	Y in mm/sec	Z in mm/sec	Mag
0	100	0	0	80
5	-60	-35	0	80
10	25	40	0	80
15	0	-80	0	80
20	-40	70	0	80

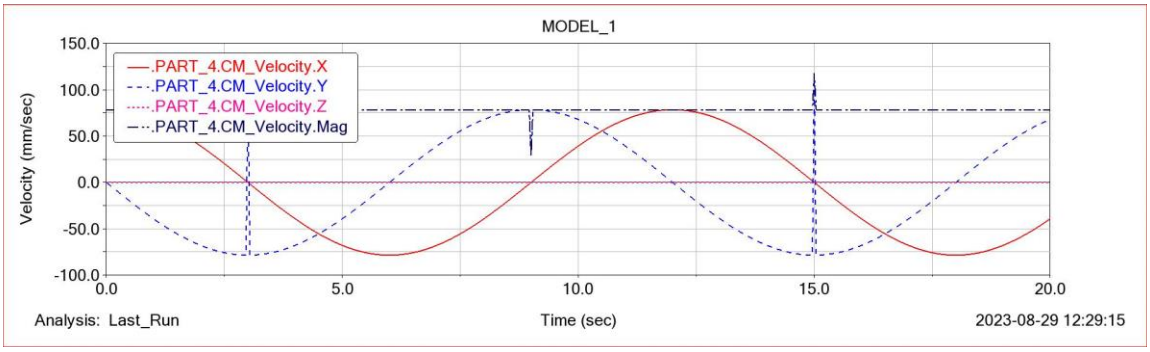
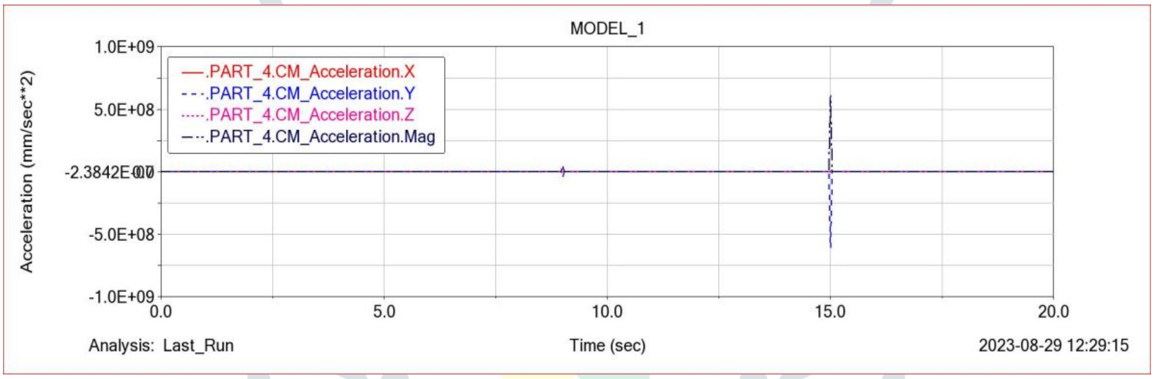


Figure 3.11 Part 4 Velocity in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.11 shows the Part 4 of six bar linkage mechanism Velocity in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.9 Part 4 Acceleration values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm/sec^2	Y in mm/sec^2	Z in mm/sec^2	Mag
0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0
5	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0
10	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0
15	4.0E+08	4.0E+08	4.0E+08	4.0E+08
20	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0	-2.3842E00.0



Fjgure 3.12 Part 4 Acceleration in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.12 shows the Part 4 of six bar linkage mechanism Acceleration in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

3.2.2.4 TABLES AND GRAPHS OF POSITION, VELOCITY, AND ACCELERATION OF PART 5

Table 3.10 Part 5 Position values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm	Y in mm	Z in mm	Mag
0	50	300	0	300
5	150	-270	0	325
10	-210	150	0	260
15	350	0	0	350
20	-210	-150	0	250

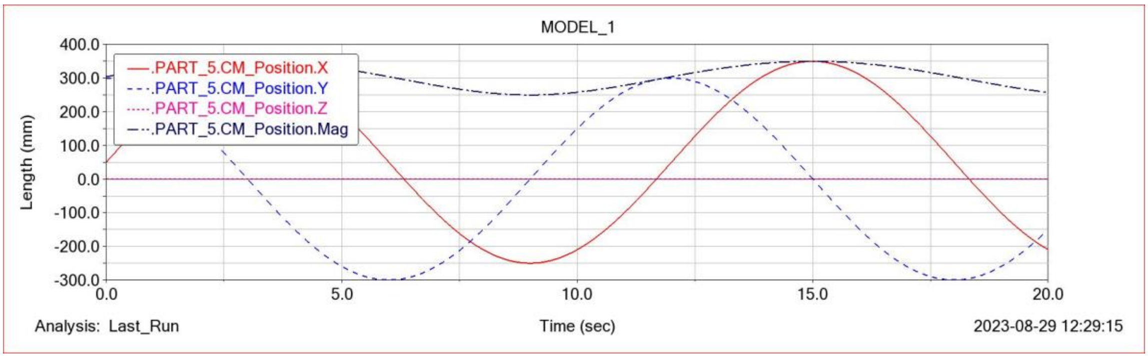


Figure 3.13 Part 5 Position in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.13 shows the Part 5 of six bar linkage mechanism Position in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.11 Part 5 Velocity values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm/sec	Y in mm/sec	Z in mm/sec	Mag
0	200	0	0	200
5	-225	-200	0	200
10	100	125	0	200
15	0	-200	0	200
20	-100	125	0	200

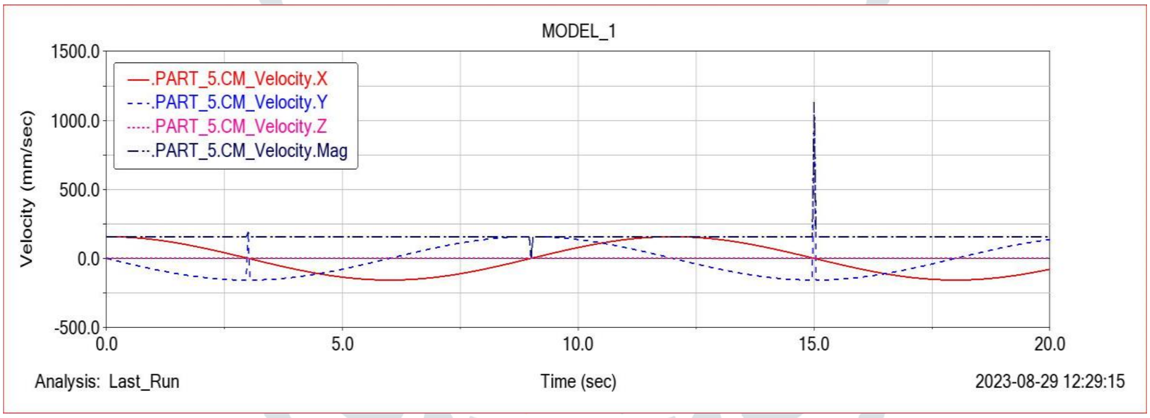


Figure 3.14 Part 5 Velocity in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.14 shows the Part 5 of six bar linkage mechanism Velocity in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.12 Part 5 Acceleration values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm/sec^2	Y in mm/sec^2	Z in mm/sec^2	Mag
0	0	0	0	0
5	0	0	0	0
10	0	0	0	0
15	2.75E+10	2.75E+10	2.75E+10	2.75E+10
20	0	0	0	0

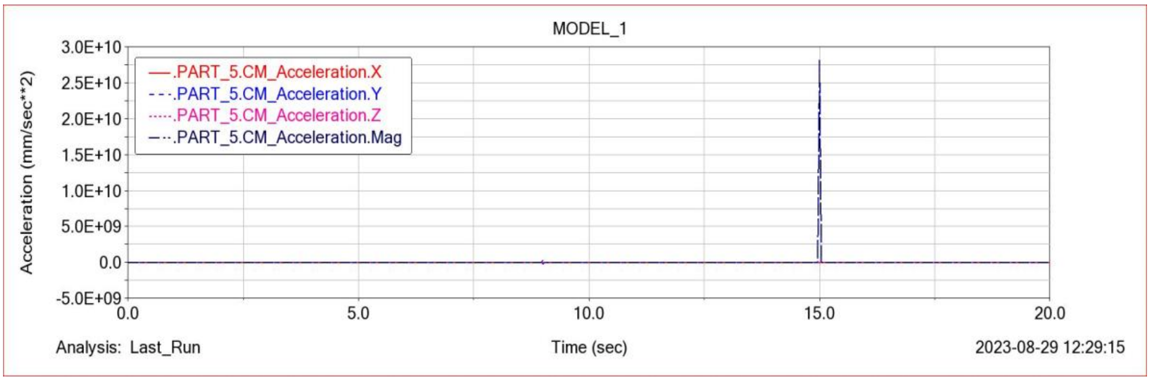


Figure 3.15 Part 5 Acceleration in X, Y, Z and Magnitude Analysis with graph in Adams view

The above figure 3.15 shows the Part 5 of six bar linkage mechanism Acceleration in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

3.2.2.5 TABLES AND GRAPHS OF POSITION, VELOCITY, AND ACCELERATION OF PART 6

Table 3.13 Part 6 Position values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm	Y in mm	Z in mm	Mag
0	300	150	0	340
5	370	-125	0	380
10	175	175	0	190
15	450	0	0	450
20	175	-70	0	190

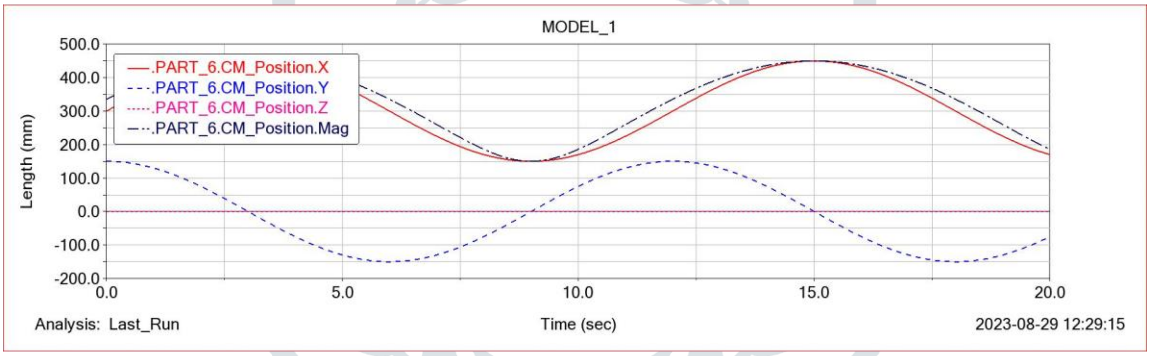


Figure 3.16 Part 6 Position in X, Y, Z and Magnitude Analysis with graph in Adams Software

The above figure 3.16 shows the Part 6 of six bar linkage mechanism Position in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.14 Part 6 Velocity values in X, Y, Z and Magnitude Analysis in Adams software

Time in sec	X in mm/sec	Y in mm/sec	Z in mm/sec	Mag
0	50	0	0	50
5	-50	-100	0	50
10	40	50	0	50
15	0	1000	0	1000
20	-40	50	0	50

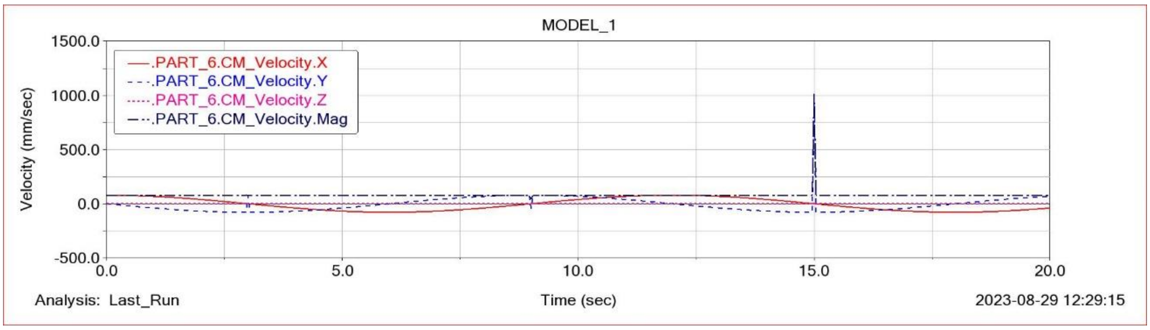


Figure 3.17 Part 6 Velocity in X, Y, Z and Magnitude Analysis with graph in Adams Software

The above figure 3.17 shows the Part 6 of six bar linkage mechanism Velocity in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

Table 3.15 Part 6 Acceleration values in X, Y, Z and Magnitude Analysis in Adams view

Time in sec	X in mm/sec^2	Y in mm/sec^2	Z in mm/sec^2	Mag
0	0	0	0	0
5	0	0	0	0
10	0	0	0	0
15	2.75E+10	2.75E+10	2.75E+10	2.75E+10
20	0	0	0	0

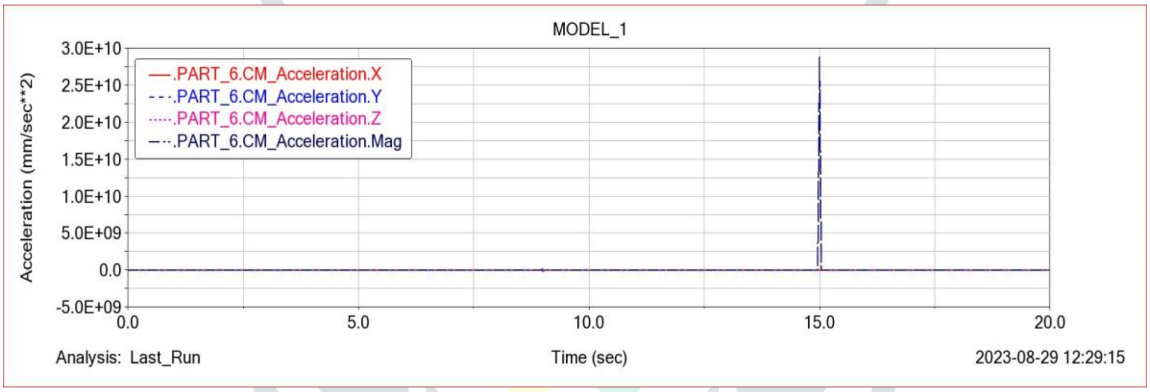


Figure 3.18 Part 6 Acceleration in X, Y, Z and Magnitude Analysis with graph in Adams Software

The above figure 3.18 shows the Part 6 of six bar linkage mechanism Acceleration in X, Y, Z and Magnitude analysis along with the graph in Adams software as been presented.

IV. RESULTS AND DISCUSSION

Present data on key kinematic parameters like Position, velocities, and accelerations of the Six bar linkage mechanism parts or components in Adams View Software. Provide visual representations of the Six bar linkage mechanism in form of graphs in Adams View, that is motion plots, to illustrate how Six bar linkage mechanism operates in Adams View Software. Designing a six-bar mechanism in CATIA V5 and then analyzing it in Adams View involves a comprehensive workflow. Here's a discussion and potential results for this process is firstly we have to Design a Six bar mechanism in CATIA V5 Software, after that we have to specify its geometry, dimensions, and constraints accurately. And after that we have to assemble the various components of the Six bar mechanism, also defining the joints and connections between them. Ensure that the design is feasible and adheres to mechanical principles. And after the completion of assembly model of Six bar mechanism in CATIA V5 Software then we have to save the file in suitable format. And here we use the step or stp format to save the CATIA V5 assembly model of Six bar mechanism and that step or stp format is used for importing the assembly model of Six bar mechanism in Adams View Software. In Adams View, set up the simulation environment for the six-bar mechanism, defining initial conditions, boundary conditions, and also we have to fix the some parts of required and and we have to give the movements between the parts of Six bar linkage mechanism and we have to Perform the kinematic analysis in Adams View Software to visualize and verify the motion of the mechanism. Ensure that it behaves as expected based on the CATIA V5 design and its assembly of Six bar linkage mechanism.

V. CONCLUSION

The design and analysis of a six-bar mechanism using CATIA V5 and Adams software has proven to be a valuable and insightful endeavor. CATIA V5 provided a robust platform for creating a detailed and precise CAD model of the mechanism, allowing for the exploration of various design iterations and ensuring the mechanical integrity of the system. The parametric modeling capabilities of CATIA V5 facilitated quick adjustments to key parameters, streamlining the design process. Once the CAD model was finalized, Adams was instrumental in conducting Kinematic simulations and analysis of the six-bar mechanism. Adams powerful simulation capabilities allowed for the investigation of the Six Bar Mechanism behavior under different Position, Velocity, and Acceleration conditions. This Adams view was crucial in optimizing the design for desired performance characteristics and ensuring the Six Bar Mechanism reliability in real-world applications. Moreover, the integration between CATIA V5 and Adams view proved to be a seamless and efficient way to transfer the CAD model from CATIA V5 through stp (step format) into the environment of Adams view. By using Adams view we can get more accurate Graphs compared CATIA V5 due to this we can save our valuable time in the overall process. The combination of Catia V5 and Adams software proved to be Good for designing and analyzing of a Six Bar Mechanism. The CAD design capabilities of Catia V5 and the Kinematic simulation of Adams view collectively provided a comprehensive solution for achieving a robust and well-performing Six Bar Mechanism. This integrated (CATIA V5 and Adams view) approach is not only valuable for engineers and designers but also opens up opportunities for innovation and optimization in various engineering applications.

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