

APRIL 2024



Pmass Manual

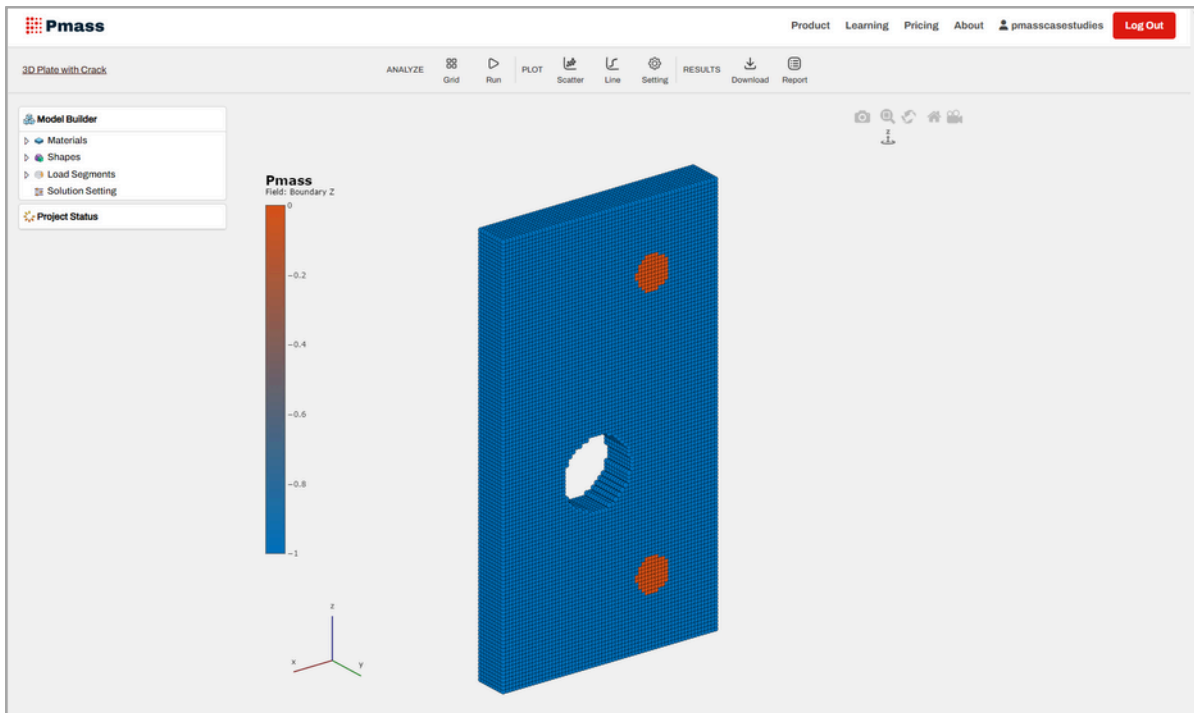
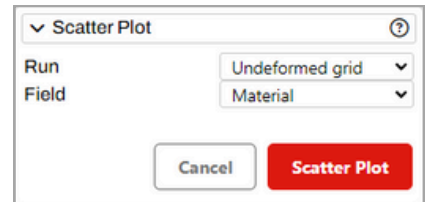
Post-Processing

www.pmass.io

Pmass offers real-time stress and failure analysis visualization, enabling engineers to explore models, inspect crack paths, and analyze critical areas with interactive tools. Customizable reports facilitate clear communication to stakeholders and regulatory bodies. Pmass's embedded post-processing tool allows users to visualize the simulation results using scatter and line plots. In addition, users can download the simulation results as text files, so that other post-processing tools can be used to visualize the results.

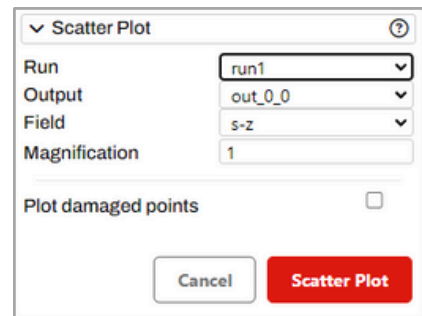
Scatter the Grid

To scatter the undeformed grid, click on the Scatter button on the Controlbar. This triggers a setting panel. In Run field, select the Undeformed grid. Then select a Field. Options are Material, Inclusion, Boundary (X, Y and Z), No-Failure Zone, Output Zone. Click on Scatter Plot button. This will scatter the grid points in the viewer. The color of each point reflects its field.



Scatter the Results

To effectively visualize and analyze the simulation results in Pmass, use the Scatter tool located on the Controlbar. This tool allows you to selectively view different aspects of your simulation data through a detailed and customizable scatter plot. Click on the "Scatter" button on the Controlbar to open the corresponding settings panel.



Configuring Scatter Plot Settings

1. Selecting Run:

- In the "Run" field, choose the desired run by its name from the dropdown menu. This allows you to specify which simulation run's results you want to analyze.

2. Choosing Output File:

- In the "Output" field, select the output file you wish to visualize. The filenames generally follow the format "out_i_j", where "i" is the load segment ID and "j" is the increment within that load segment.
- If bond breakage limitation was set during simulation, filenames might include an additional segment "k", denoting "out_i_j_k", where "k" represents the step ID within an increment.

3. Field Selection:

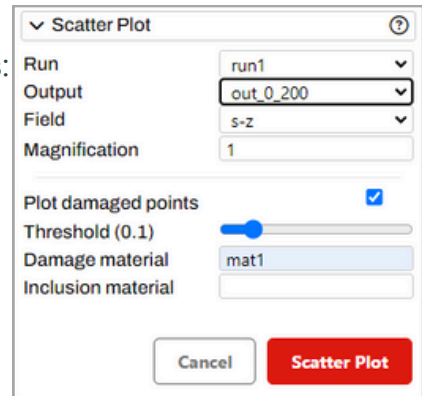
- Choose which field to scatter from the options available. These fields represent various physical properties:
 - Displacement (u_x , u_y , u_z), strain (e_x , e_y , e_z , e_{xy} , e_{yz} , e_{zx}), stress (s_x , s_y , s_z , s_{xy} , s_{yz} , s_{zx}), principal strain (e_{p1} , e_{p2} , e_{p3}), principal stress (s_{p1} , s_{p2} , s_{p3}), equivalent strain (e_{eq}), equivalent stress (s_{eq}), volumetric strain (e_{vol}), initial damage ($damage_{ini}$), and damage.

4. Setting Magnification:

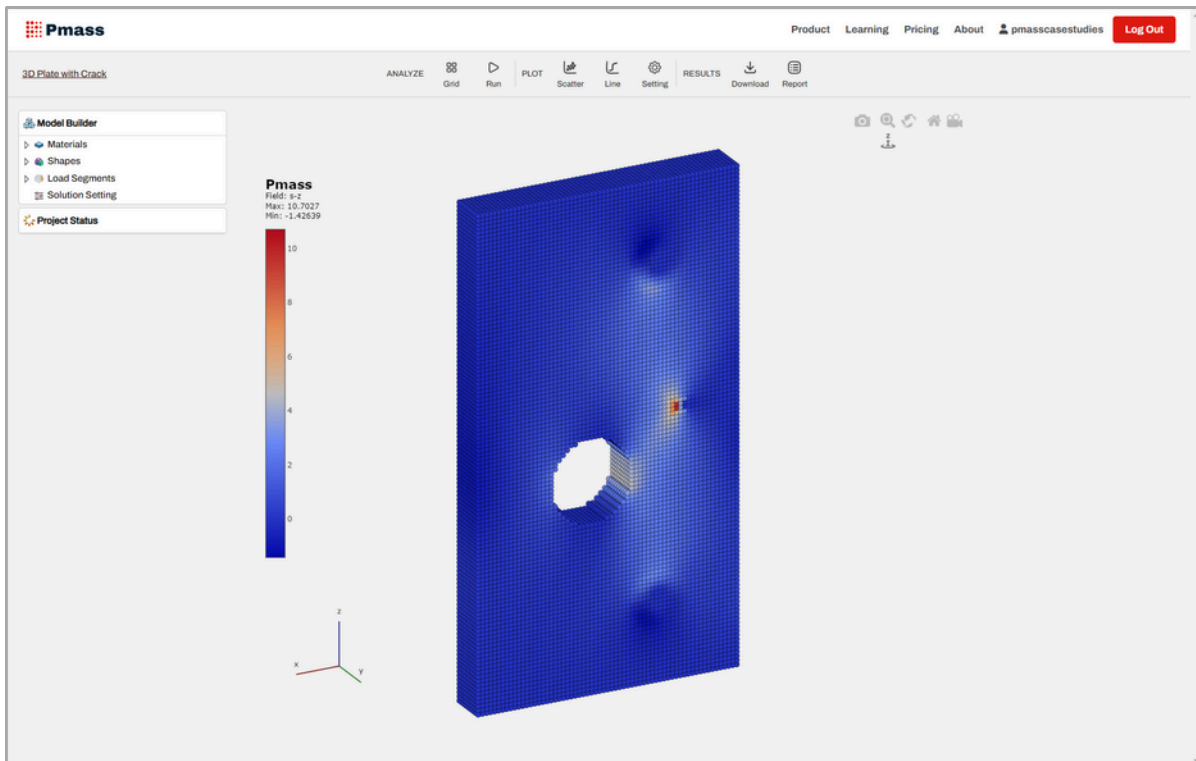
- Enter a magnification value to visually enhance the deformations in the scatter plot, making it easier to observe subtle changes or patterns.

5. **Plotting Damaged Points (Optional):** check the “Plot damaged points” box to activate additional settings:

- o **Threshold:** Set a damage threshold between 0 and 1. Points with damage exceeding this threshold will be displayed.
- o **Damage Material:** Specify if you want to plot damaged points for particular materials.
- o **Inclusion Material:** Optionally, list materials whose points you want to highlight with a predefined default color, irrespective of their damage status.

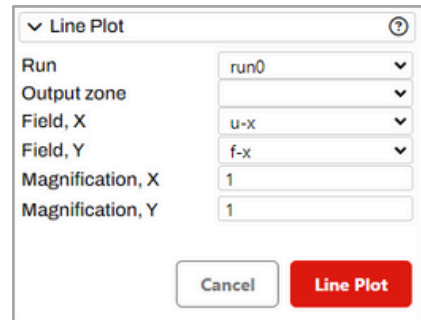


Once all settings are adjusted according to your needs, click the "Scatter Plot" button. This action generates the scatter plot in the viewer, where each point is color-coded based on the selected field.



Line Plot

This tool is for creating line plots, which are essential for analyzing relationships in the data, such as displacement versus force or strain versus stress curves. These plots help in understanding the material behavior under applied loads. Click on Line button on the Controlbar to open the corresponding settings panel.



Configuring Line Plot Settings

1. Selecting Run:

- In the "Run" field, choose the desired run by its name from the dropdown menu. This allows you to specify which simulation run's results you want to analyze.

2. Choosing Output File:

- In the "Output" field, select the output file you wish to visualize. The filenames generally follow the format "out_i_j", where "i" is the load segment ID and "j" is the increment within that load segment.
- If bond breakage limitation was set during simulation, filenames might include an additional segment "k", denoting "out_i_j_k", where "k" represents the step ID within an increment.

3. Field Selection:

- Choose which two fields for x-axis and y-axis to plot the curves from the options available. These fields represent various physical properties:
 - Increment, Displacement (u_x , u_y , u_z), and Force (u_x , u_y , u_z).

4. Setting Magnification:

- Enter magnification value for x-axis and y-axis.

Once all settings are adjusted according to your needs, click the "Line Plot" button. This action generates the line plot in the viewer.

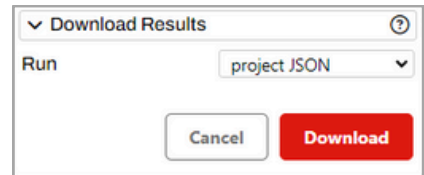
Download

The Download tool in Pmass is essential for exporting raw simulation results and project configuration files to your local computer. This functionality allows you to utilize third-party tools for advanced post-processing and detailed analysis. Click on Download button on the Controlbar to open the corresponding settings panel.

Configuring Download Settings

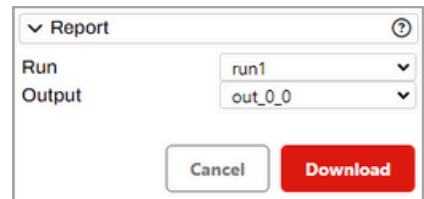
1. Selecting Run:

- To download the project JSON file, in the "Run" field, choose the "Project JSON" and click on the Download button.
- To download simulation result file(s), in the "Run" field, choose the desired run by its name from the dropdown menu. This allows you to specify which simulation run's results you want to analyze. Then proceed to next step.



2. Choosing Output File:

- If you want to download all solution files for the selected run, in the "Output" field, select "All". This will create a zip file from all output files available for this run.
- If you want to download a specific file, in the "Output" field, select the output file you wish to download. The filenames generally follow the format "out_i_j", where "i" is the load segment ID and "j" is the increment within that load segment.
- If bond breakage limitation was set during simulation, filenames might include an additional segment "k", denoting "out_i_j_k", where "k" represents the step ID within an increment.



Once all settings are adjusted according to your needs, click the "Download" button. This action downloads the specified file to your local machine.

Report

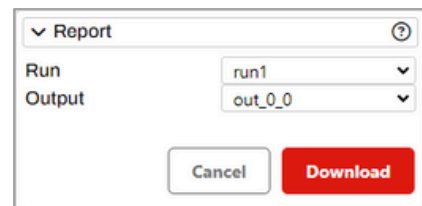
The Report tool in Pmass is a powerful feature designed to streamline the documentation and presentation of your simulation results. By generating real-time reports in PDF format, you can effectively communicate detailed findings, including raw simulation results and project configurations. The report includes visualizations and descriptions that help stakeholders understand the geometry of the model, the conditions under which simulations were run, and any modifications made during the project.

Click on Report button on the Controlbar to open the corresponding settings panel.

Configuring Report Settings

1. Selecting Run:

- In the "Run" field, choose the desired run by its name from the dropdown menu. This allows you to specify which simulation run's results you want to generate the report.



2. Choosing Output File:

- In the "Output" field, select the output file you wish to generate report for. The filenames generally follow the format "out_i_j", where "i" is the load segment ID and "j" is the increment within that load segment.
- If bond breakage limitation was set during simulation, filenames might include an additional segment "k", denoting "out_i_j_k", where "k" represents the step ID within an increment.

Once all settings are adjusted according to your needs, click the "**Download**" button. Pmass will compile the data, charts, and analyses into a formatted PDF document. Once the report is generated, it will be downloaded automatically to your local machine. This PDF can then be shared with stakeholders, regulatory bodies, or kept for record-keeping.

The Report tool in Pmass not only enhances your ability to document and analyze simulation results but also aids in the clear and effective communication of complex data and insights. By leveraging this tool, you can produce professional, comprehensive reports that are valuable for decision-making, presentations, and compliance submissions.