

*Exceptional service in the national interest*



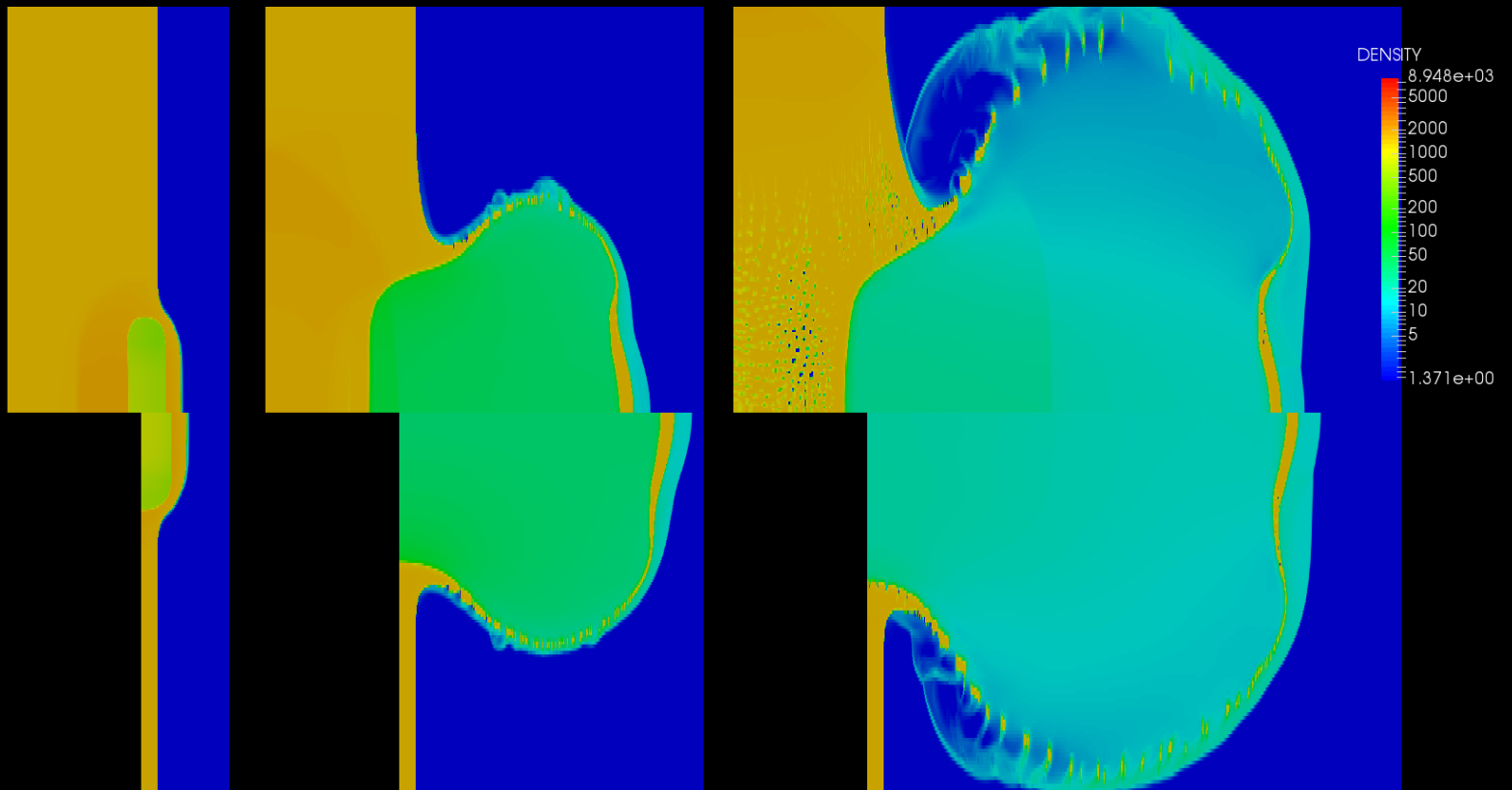
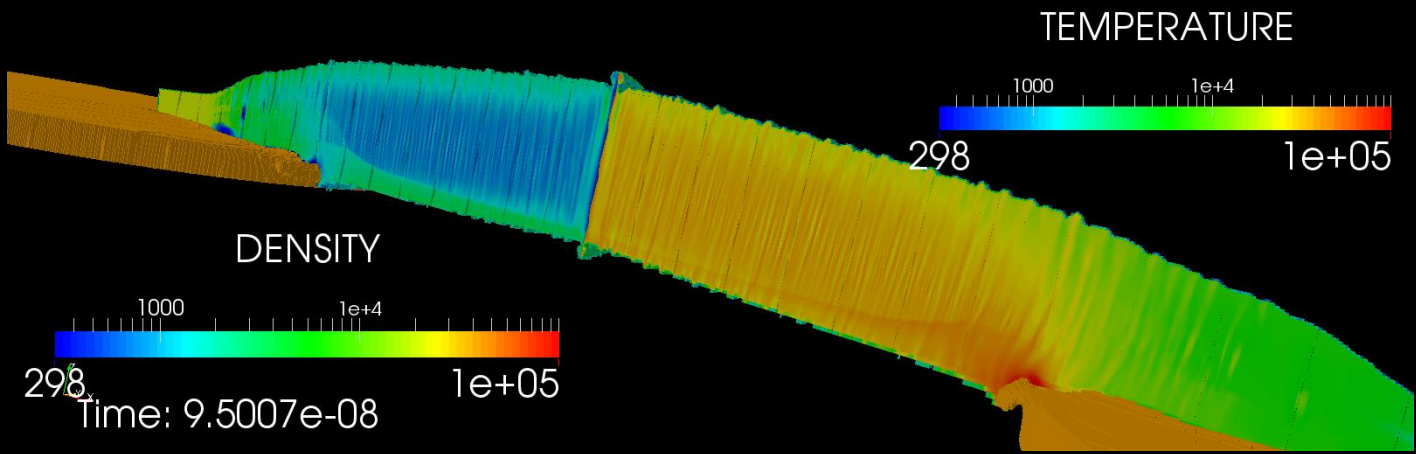
# MeDEA- Multi-purpose Display & Engineering Analysis

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Input deck driven codes typically require 100's of lines of input in order to mesh the domain, specify materials, establish boundary and initial conditions and then execute. Post-processing of results are left to the user's discretion in terms of software choice, layout, look and feel, and quality of presentation.

For a new or infrequent user, this process itself is an obstacle to obtaining rapid results for simulations which might need to be explored multiple times before a satisfactory result is obtained.

Can't we improve the process?



# General Purpose Modeling Startup

Domain

Grid/Meshing

Physics

BCs

ICs

Material Geometry & Type

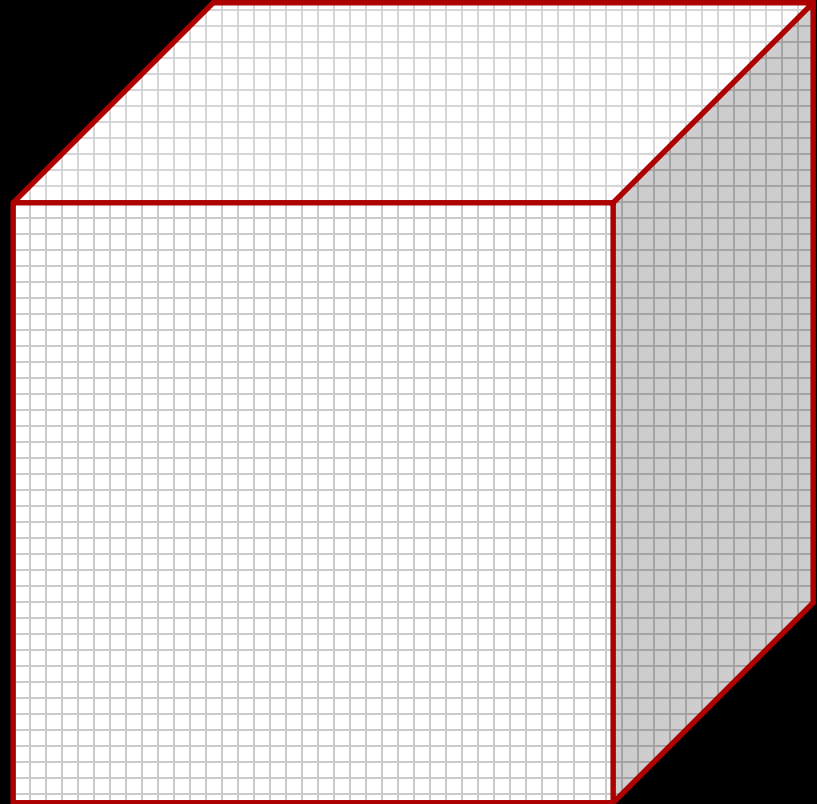
External Coupling (Circuit)

Solvers

Derived Variables

Output

~400 lines of input

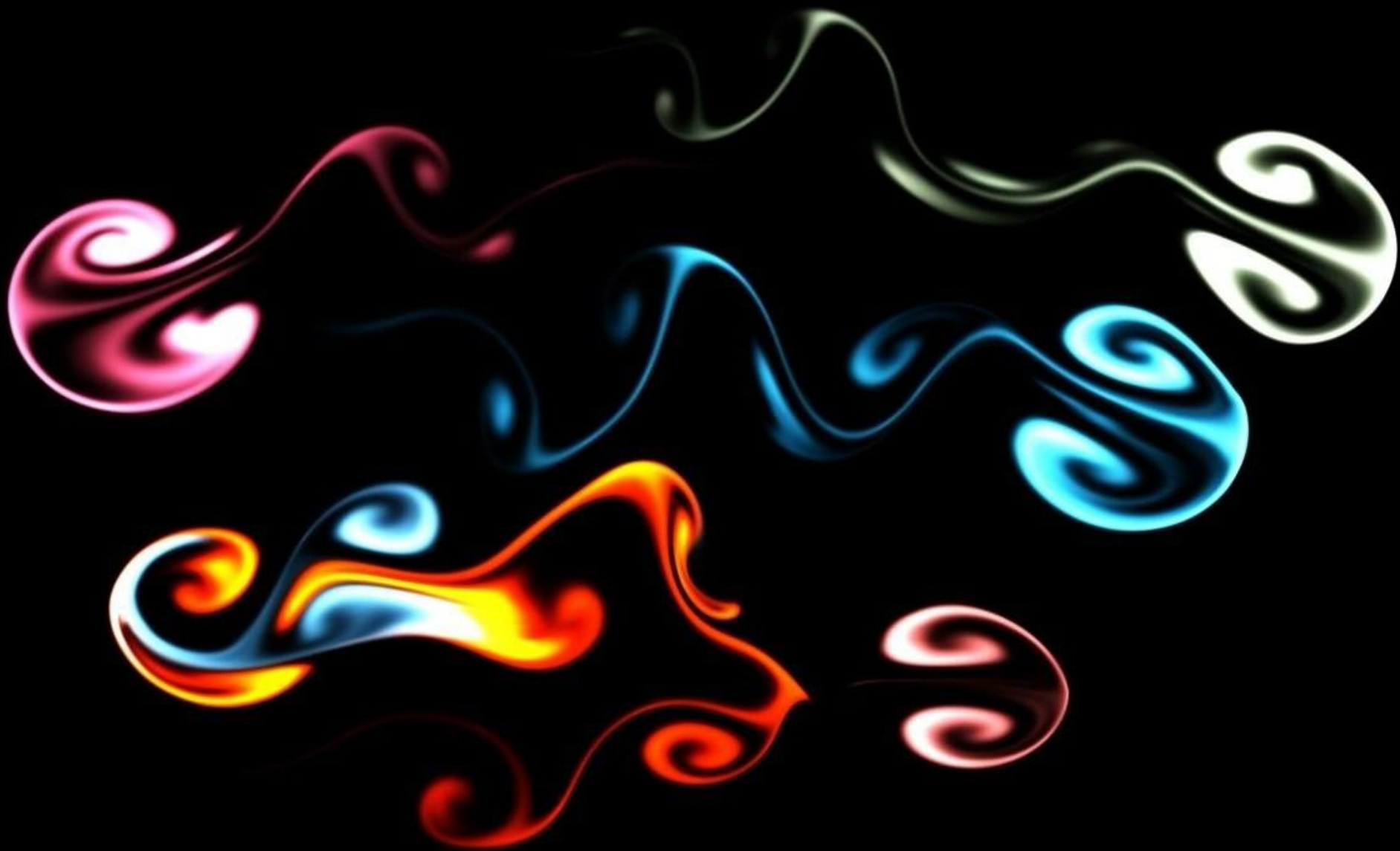


What are some common questions asked by novice ALEGRA users?

A night sky with a full moon, stars, and clouds. The moon is in the upper right quadrant, and the stars are scattered across the dark blue sky. The clouds are dark and wispy, with some lighter patches near the horizon.

*I dreamed a dream*









**BASIC  
NEEDS**

**VIEW**

**ANALYZE**

**SIMULATE**



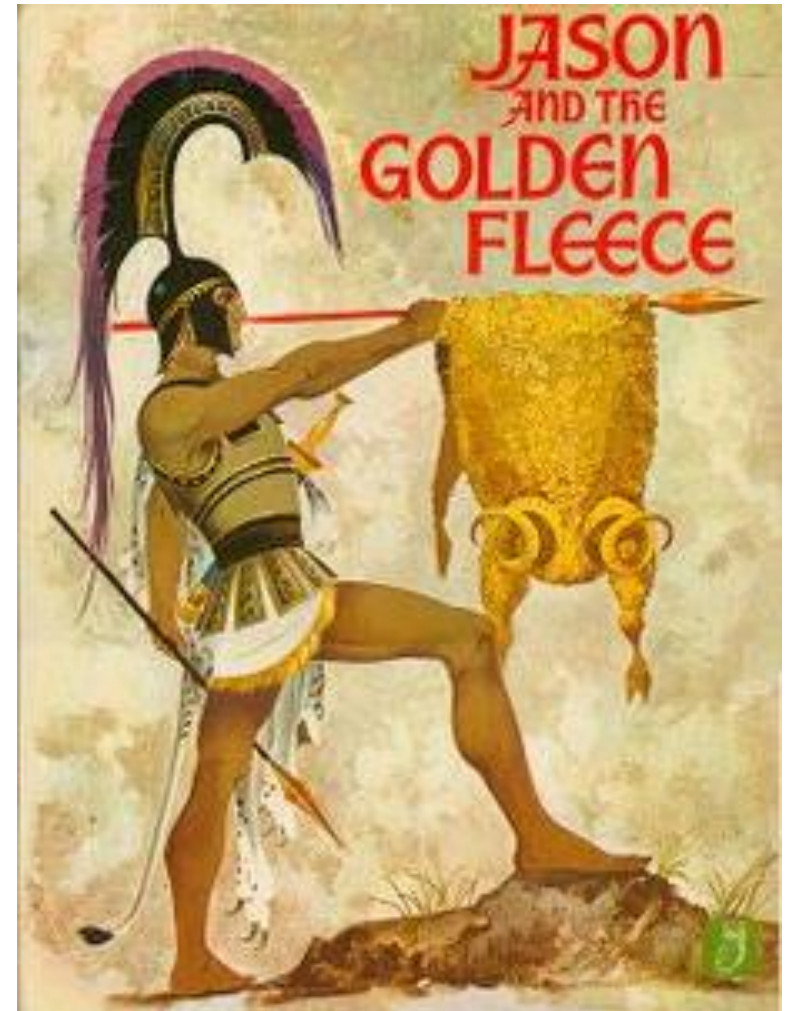
# MeDEA

Multipurpose

Detonator

Engineering

Analysis



VIEW

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SIMULATE

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ANALYZE

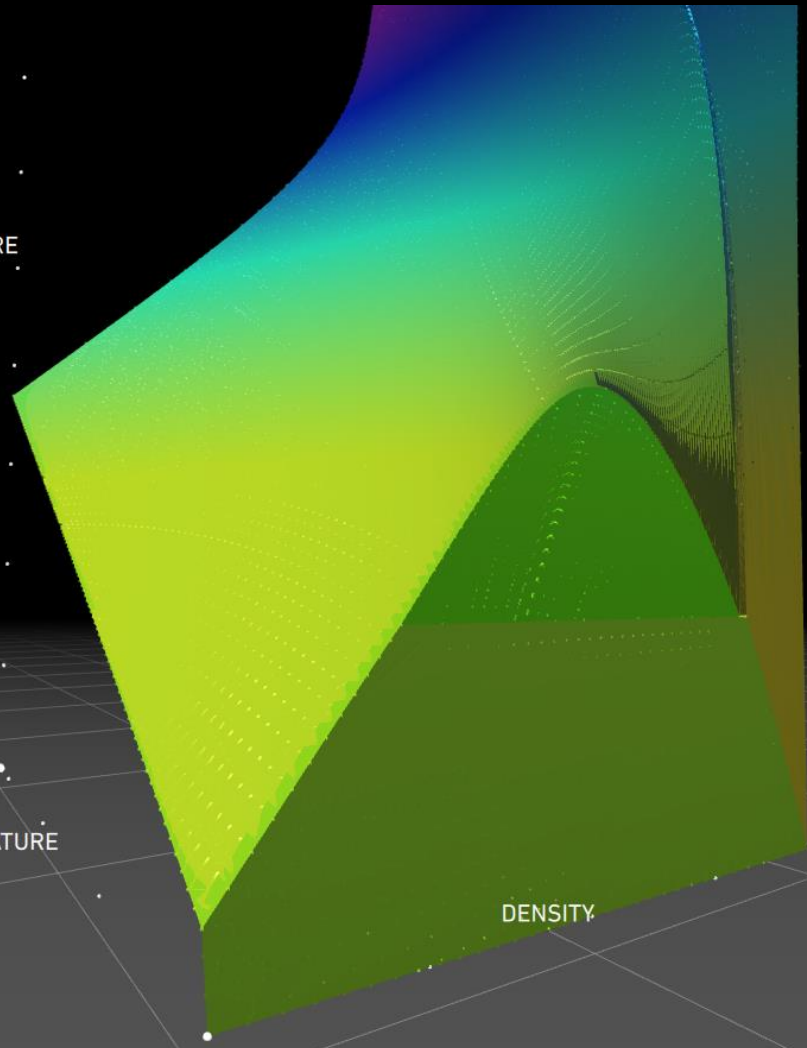
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PRESSURE

TEMPERATURE

DENSITY





### VARIABLE GROUP 3



click a field to edit its value

resistance

150

[ mOhms ]

inductance

20

[ nHenries ]

capacitance

0.12

[ uFarads ]

voltage

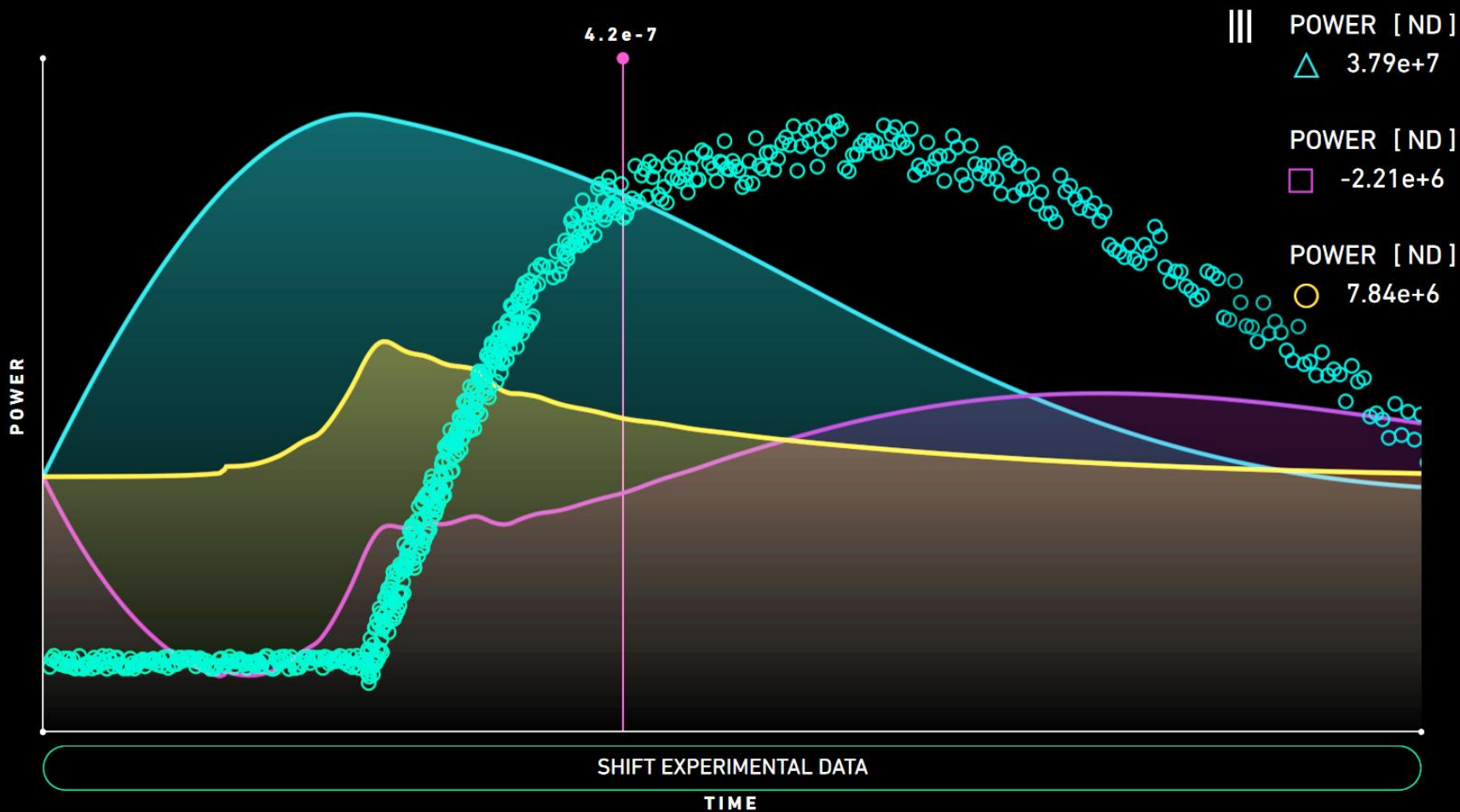
1400

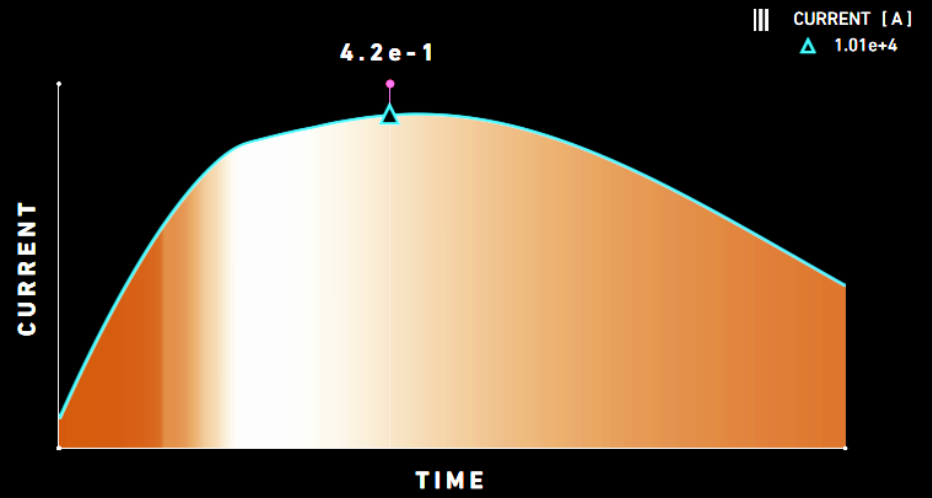
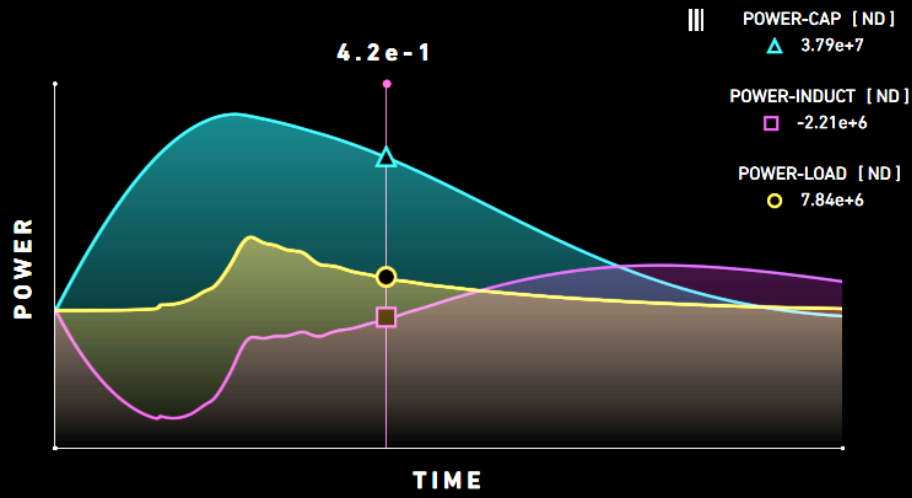
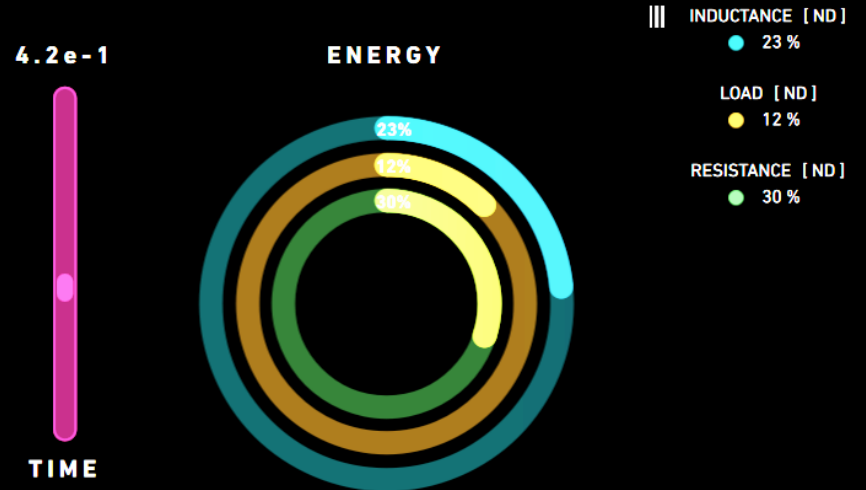
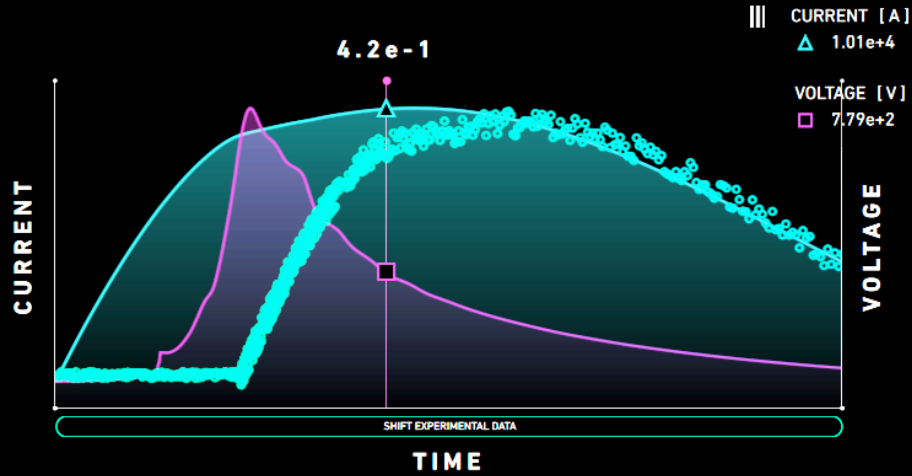
[ Volts ]



SIMULATE

Rather than directly accessing the input deck, the user interfaces with a GUI which displays variable name entries and values which can be updated. Once completed the user then pushes the SIMULATE button to run the simulation.







SELECT A TABLE FOR ANALYSIS

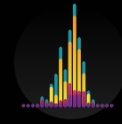


X : 23.4567  
Y : 28.3489  
Z : 27.4532  
C : 24.3873

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet



CLICK OR DRAG ON A SECTION OF SUB PLOT



X : 23.4567    Z : 27.4532  
Y : 28.3489    C : 24.3873

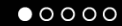
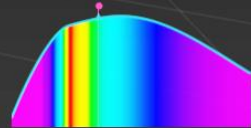
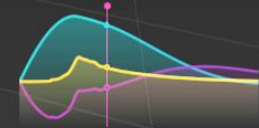
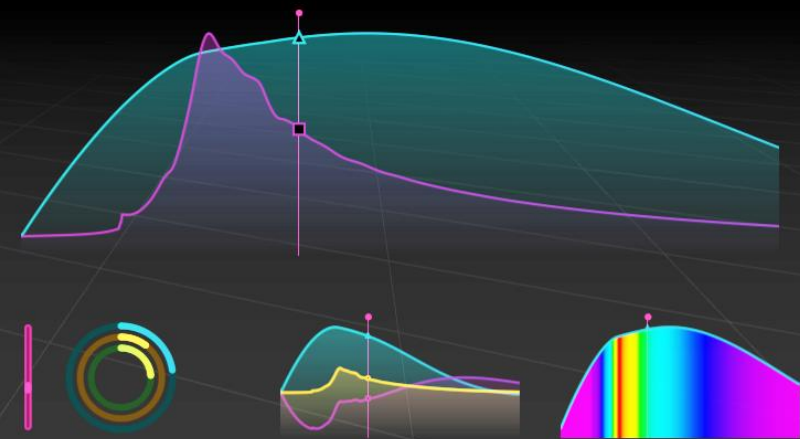
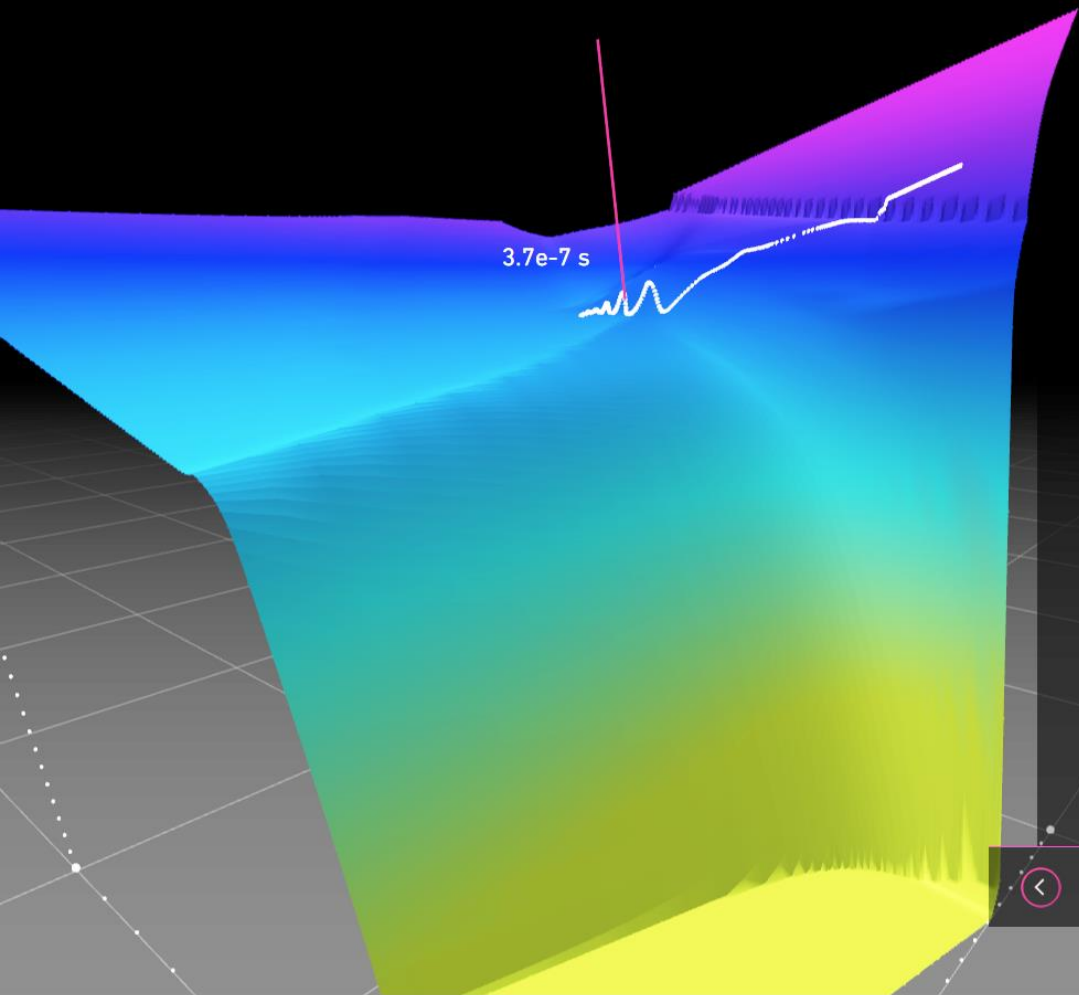


Table #1 3D Plot : Any other relevant metadata/Title information

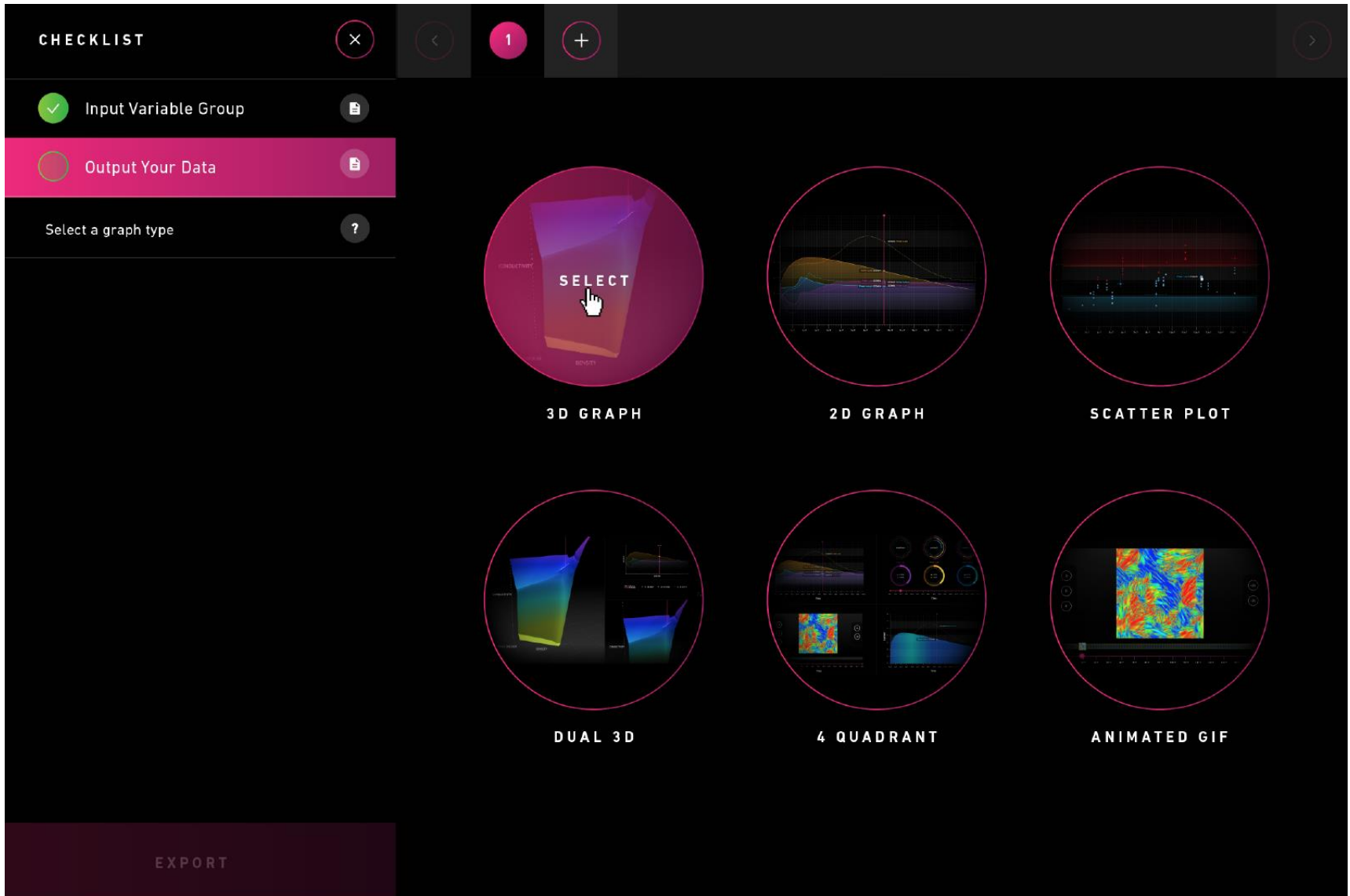




# MeDEA is driven via XML input

<pre>&lt;runCommand&gt; C:\alegra\alegra_win64\alegra2d.bat -a ebw PlD&lt;/runCommand&gt;</pre>	<p>This is the command which MEDEA will attempt to run when the simulation button is pressed by the user.</p>
<pre>&lt;dependencies&gt;   &lt;file name="ebw_PlD.*"/&gt;   &lt;file name="single_det*"/&gt;   &lt;file name="material*"/&gt; &lt;/dependencies&gt;</pre>	<p>These are the all the files which the underlying program needs in order to run the simulation. These files are copied into a working directory where the runCommand is then executed.</p>
<pre>&lt;variableGroup number="1"&gt;   &lt;variable type="float" unsigned="true" units="seconds" default="4e- 6"&gt;tend&lt;/variable&gt; &lt;/variableGroup&gt;</pre>	<p>Variable Groups are established on different pages. The variable type, units, default value, and name are listed. Once the simulation button is pressed by the user a separate ASCII text file is generated (runid.include) which has the variable name and value inserted. This file is then included into the input deck which the underlying program is going to run.</p>
<pre>&lt;outputs file="sim_PlD.csv" headerlines="2"&gt;</pre>	<p>List the name of the output file from the underlying program and how many header spaces need to be skipped.</p>
<pre>&lt;activeSimulationPlot&gt;   &lt;x var="cycle"/&gt;   &lt;y var="time"/&gt;   &lt;reference_y var="tend"/&gt; &lt;/activeSimulationPlot&gt;</pre>	<p>The user may wish to monitor the evolution of the simulation using a predefined set of variables. This option creates a small poorly located subplot using the variables listed. (MEDEAv2.0 will have this improved upon)</p>
<pre>&lt;view id="1"&gt; &lt;mainplot type="lineplot"&gt;   &lt;x var="time" label="Time"/&gt;   &lt;y var="i-mesh-d1" label="Current"/&gt; &lt;/mainplot&gt; &lt;/view&gt;</pre>	<p>Visualizations are created using views. A view corresponding to a page with user-specified plot types. The order of the views corresponds to the order of the commands in the XML file, not by the id string.</p>

# XML is configurable via hand or editor



MEDEA was designed to assist user workflow by accessing an already existing templated input deck and an XML file of instructions written by a super-user. Currently MEDEA works on Windows O/S and the Mac O/S.

For more information or access to MEDEA please contact:

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MEDEA was created in collaboration with programmers and graphics artists from Ideum.

