SOLARIA THERMAL

Solving for Voltages manually using Solaria/SolariaPCB

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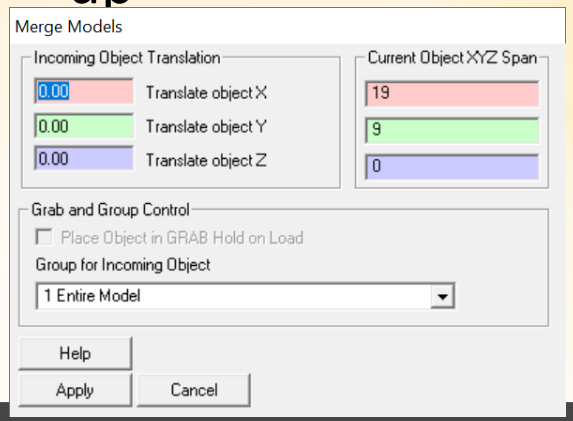
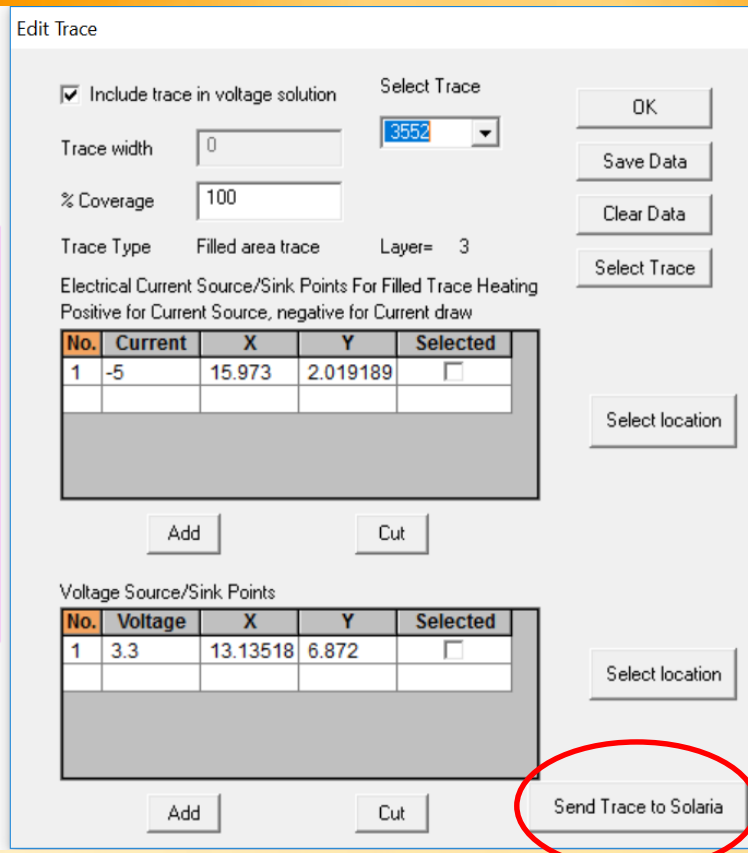
Change to the PCB>Edit Trace dialog

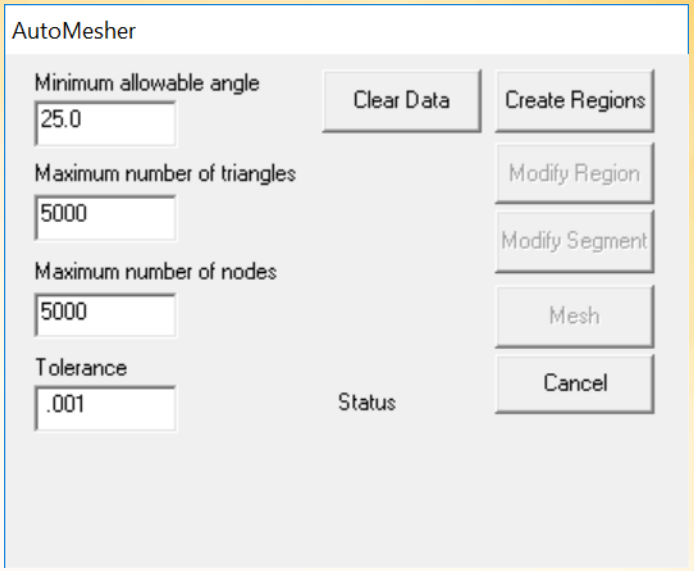
- First select a trace in the PCB>Edit Trace dialog
- Next hit Send Trace to Solaria
- The standard Merge Models dialog will come up

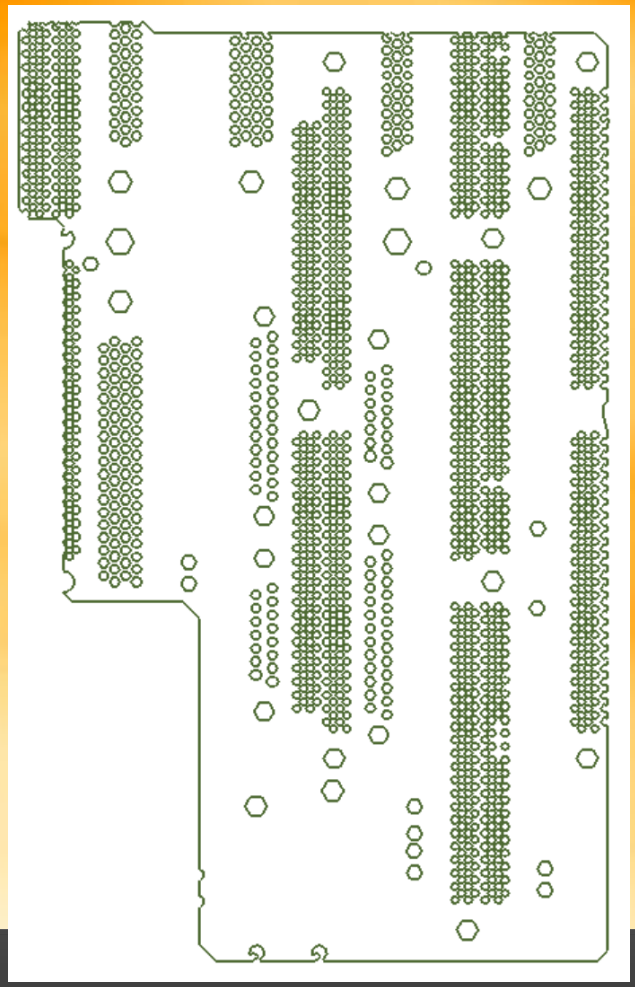




Solaria Model Generated

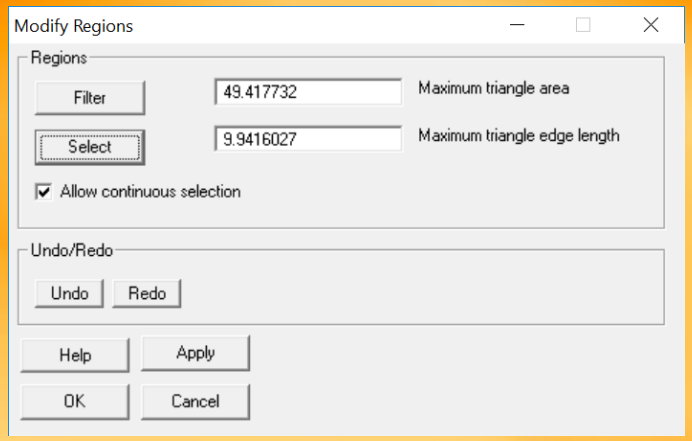
- For the highlighted trace, Nodes and Segments are generated
- The Solaria automesher can then mesh the plane





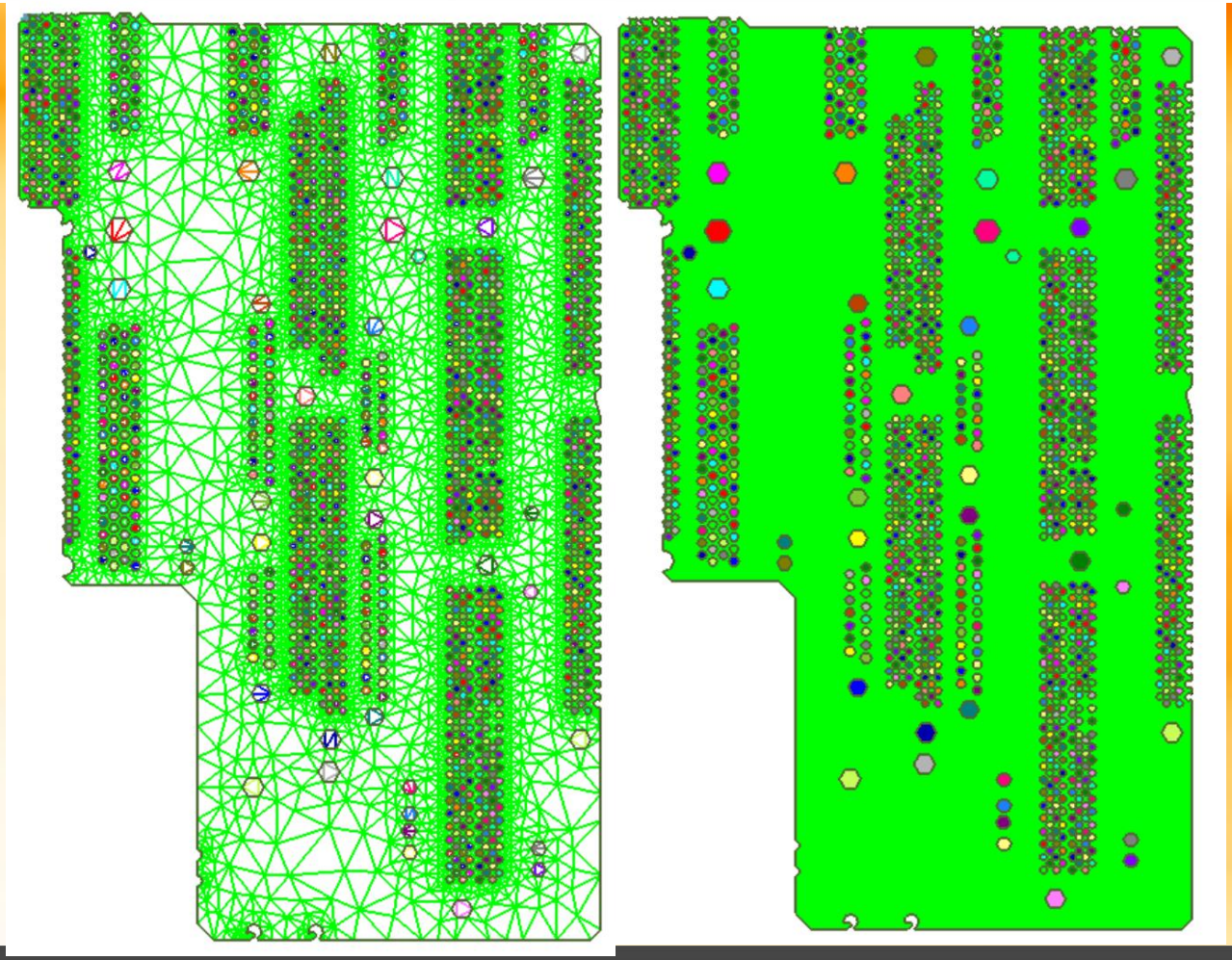
Solaria Model Generated

- Hit the Modify Region button.
- Hit the Select button and box in the center of a Segment that defines the traces edges.
- Change the Maximum triangle edge length to a reasonable number, like 0.2 inches.
- Hit the Apply button
- Hit OK



The meshed model

Next hit the Mesh button then OK when it is done.

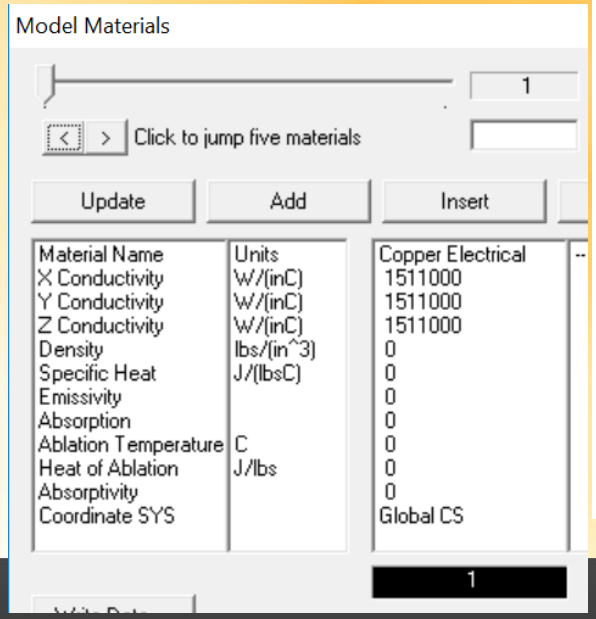


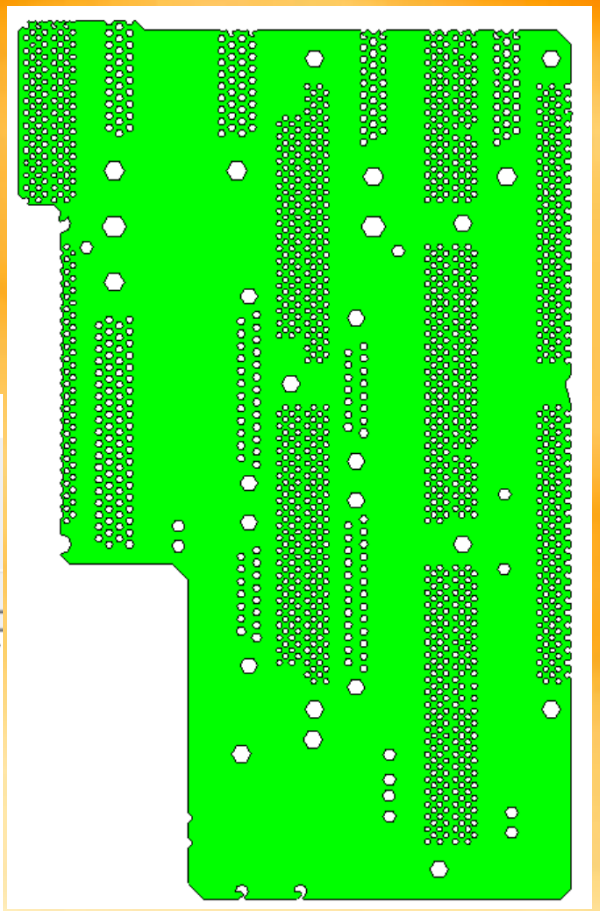
Delete the holes in the plane

- Note: All the holes will reference different Properties. Since they don't have a thickness they will not be part of the Voltage solution
- Put into a Group all the properties other than the plane, the one of interest. This is usually property 1.
- Delete all of these elements.

Solving for Voltages

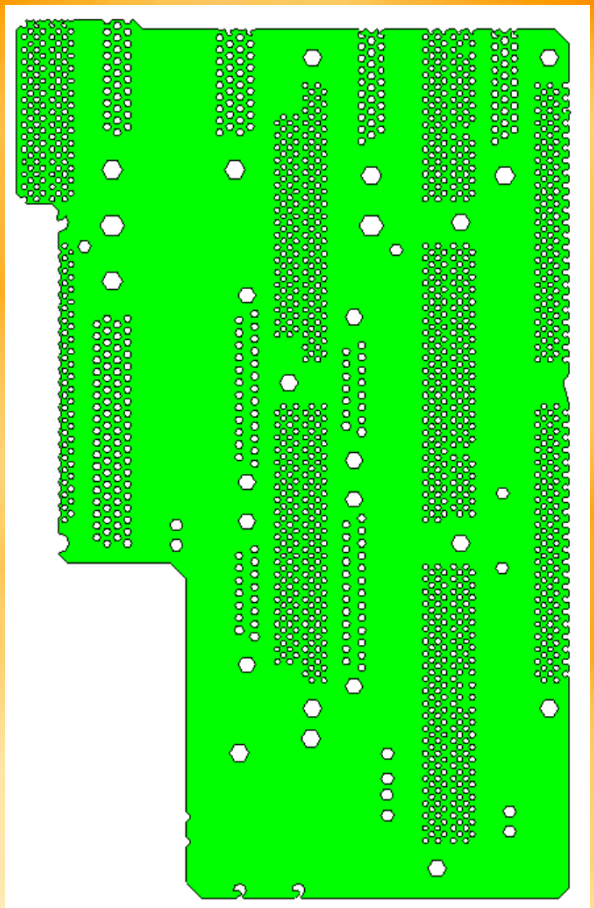
- Define a new Material with the electrical properties of copper
- Enter the plane thickness in the appropriate Property (usually number 1) and reference the new Material





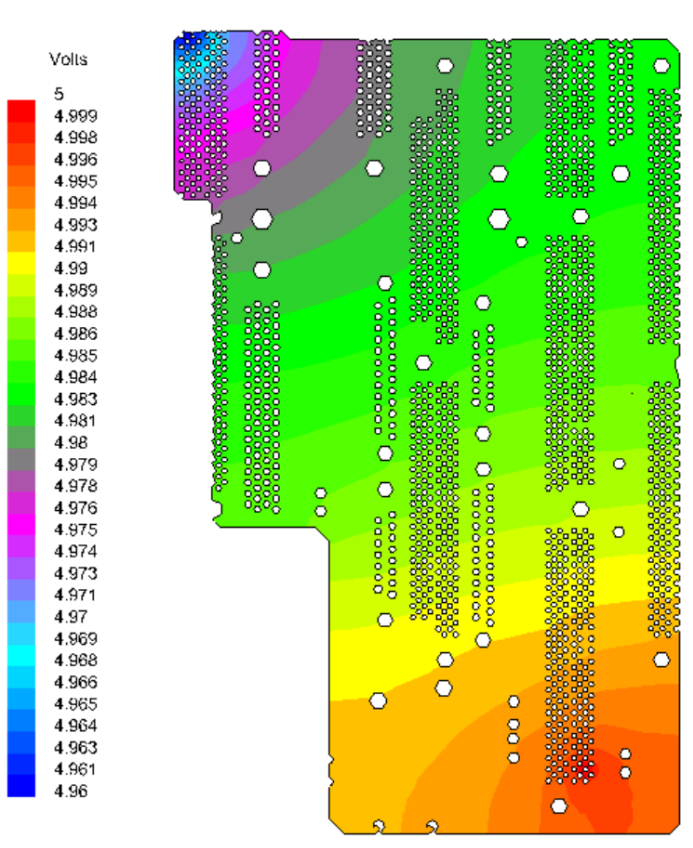
Solving for Voltages
Apply Current and Voltages

- Apply Nodal heat loads to represent locations of current draw (enter a negative value)
- Define Boundary Nodes at locations where Voltages are introduced



Model solved for Voltages

- Just hit the Solve button to solve for Voltage drop.



Getting the Joule Heating Power Dissipation

- First delete all heat loads in the model
- Select Add>Heat Load>Voltage Drop
- dV^2/R is calculated for every element where:
  - dV is the Voltage drop across the element
  - R is the electrical resistance
- The sum of the dV^2/R for each element is divided by the element area and a Surface Heat load is generated.