

# CPA Tutorial

2022/12/1

12/8/2022



# Introduction

✂ We will be taking CPA through 3 sets of runs and analysis scripts:

✂ RHSC-ET 1<sup>st</sup> run scripts:

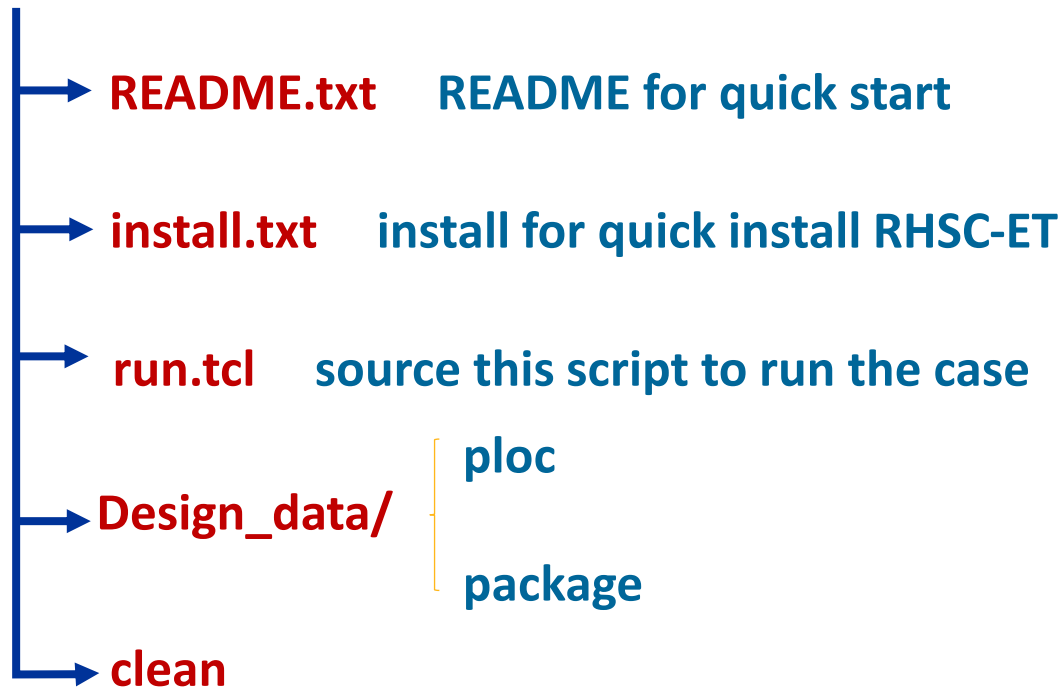
- run.tcl: this script does the following:
  - ✓ Imports data
  - ✓ Performs CPA extraction
  - ✓ Performs co-simulation
- Bring up RHSC-ET GUI to view results

✂ RHSC 2<sup>nd</sup> run scripts:

- run.py, run\_link\_siwave.py: this script does the following:
  - ✓ Imports data
  - ✓ Performs CPA extraction
  - ✓ Performs co-sim
  - ✓ Performs CPA model from Siwave-CPA
- Bring up RHSC console to view results

# RHSC-ET CPA Flow Directory Structure

## RHSC-ET CPA Flow Training directory



# / Step I: RHSC-ET Install and Set License

## ✧ Set Redhawk-SC Electrothermal path and license :

- setenv CPSROOT <choose the version installed on your server>
- set path = ( \$CPSROOT/bin \$path )
- setenv ANSYSLMD\_LICENSE\_FILE <To your redhawk\_sc\_electrothermal/redhawk\_cpa license>

## ✧ To execute Redhawk-SC Electrothermal :

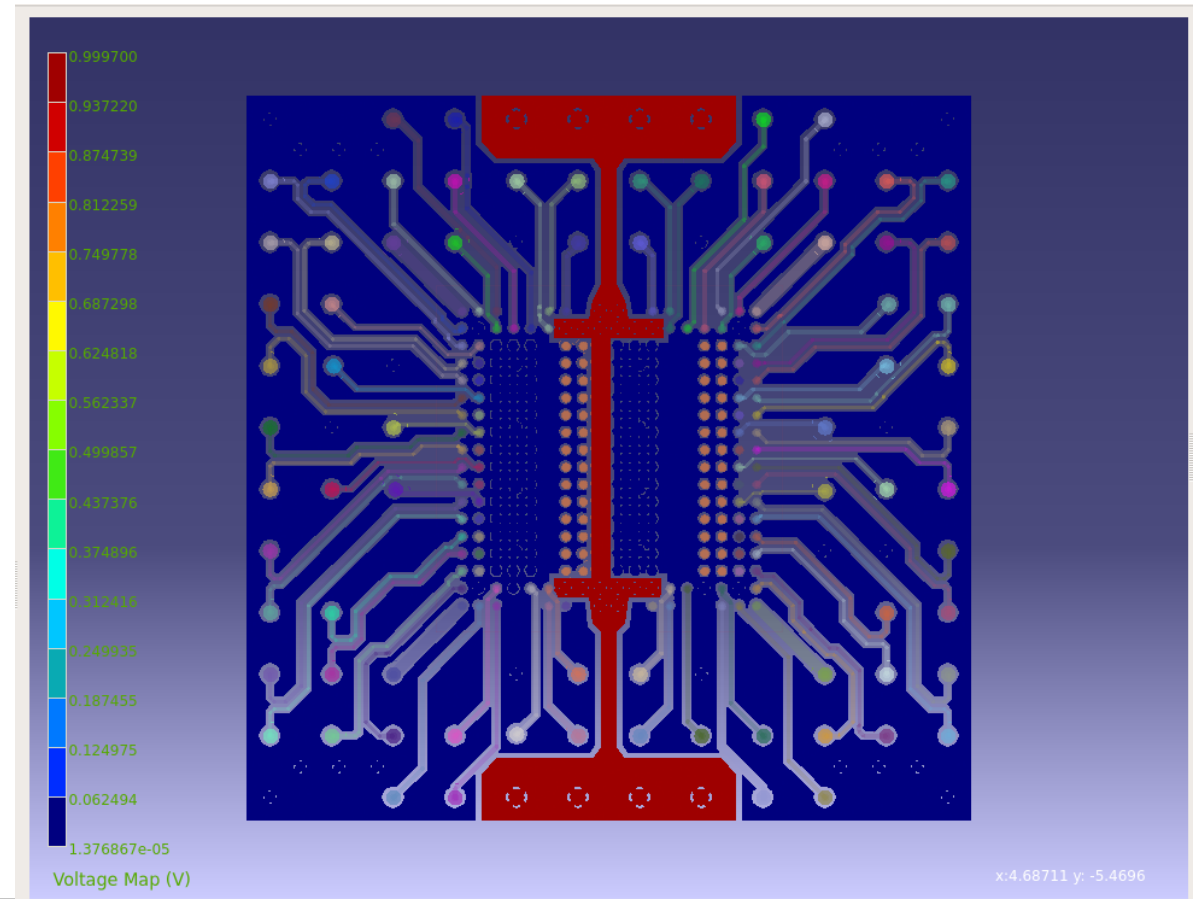
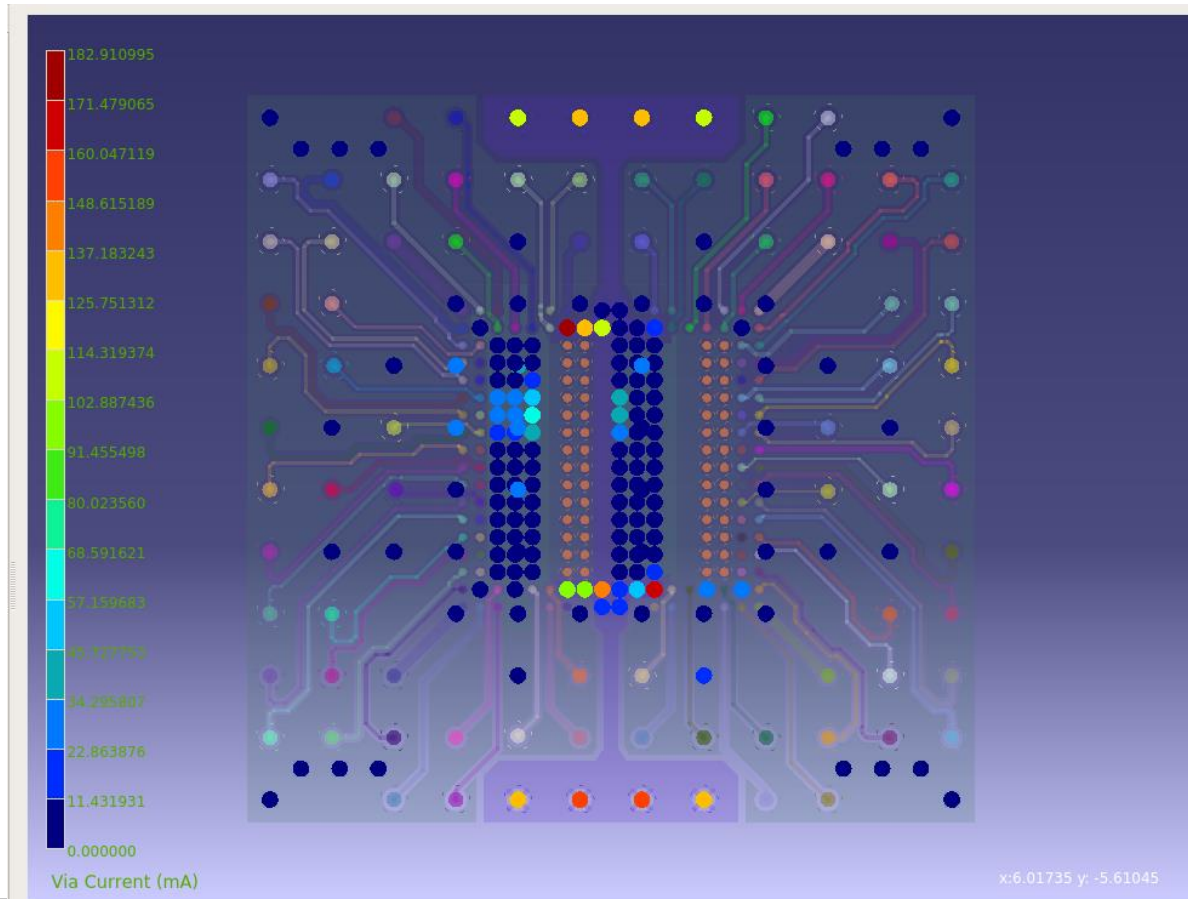
- redhawk\_sc\_et -3dic

## / Step II: Running the script: run.tcl

- ✧ First cd into the run directory
- ✧ Make sure the **design\_data** is in the same path
- ✧ To run the script:
  - % cd Training\_testcase/CPA/RHSC-ET\_CPA\_Flow
  - % redhawk\_sc\_et -ng run.tcl or // batch run, there is no GUI
  - % redhawk\_sc\_et run.tcl //GUI run
  - % redhawk\_sc\_et, and then source the run.tcl in TCL window
- ✧ What does run.tcl do?
  - ✓ Create the new project
  - ✓ Import package and ploc files
  - ✓ Perform CPA extraction
  - ✓ After finishing CPA extraction, import pad current and then run co-simulation.

## Step III: Result Exploration using GUI

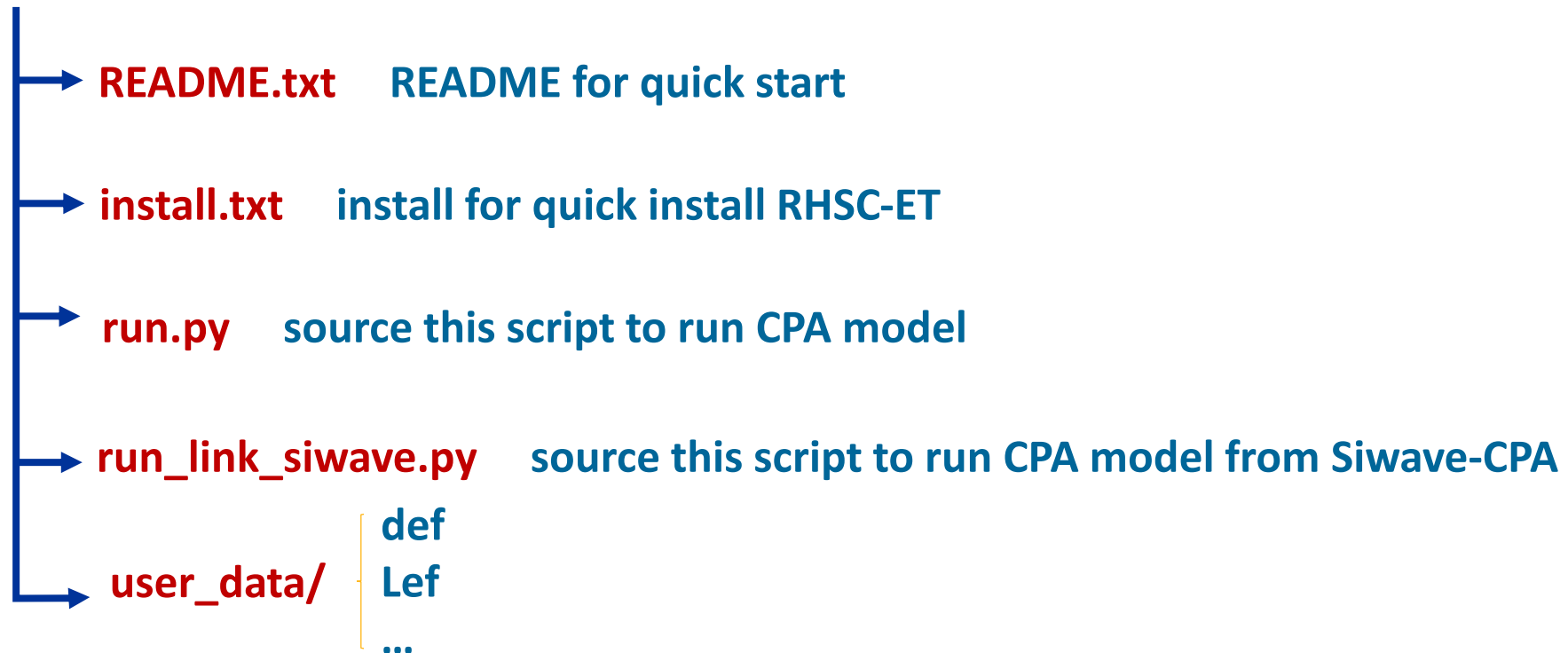
✧ View the results in RHSC-ET GUI



# **RHSC RUN Script**

# RHSC CPA Flow Directory Structure

## RHSC CPA Flow Training directory





# Step I: RHSC Install and Set License

- ❖ **Download RedHawk-SC and RedHawk-SC Electrothermal CPA Engine, Mechanical Engine and Electronics Package**
  - [https://support.ansys.com/AnsysCustomerPortal/en\\_us/Downloads/Semiconductor+Products](https://support.ansys.com/AnsysCustomerPortal/en_us/Downloads/Semiconductor+Products)
- ❖ **Install RedHawk-SC**
  - For the detail, please check install.txt
- ❖ **Set RedHawk-SC path and license :**
  - `setenv RHSCROOT <choose the version installed on your server>`
  - `set path = ( $RHSCROOT/bin $path )`
  - `setenv ANSYSLMD_LICENSE_FILE <To your redhawk_sc_electrothermal license>`
- ❖ **To execute RedHawk-SC :**
  - `$RHSCROOT/bin/redhawk_sc run.py`
  - `$RHSCROOT/bin/redhawk_sc -console (GUI mode)`

## Step II: Running the script: run.py

- ❖ First cd into the “Training\_testcase/CPA/RHSC\_CPA\_Flow
- ❖ To run the first script:

```
% cd 'Training_testcase/CPA/RHSC_CPA_Flow'  
% redhawk_sc run.py
```

- ❖ What does run.py do?
  - ✓ Import defs, lefs, libs, twfs and package files
  - ✓ Launch workers on the local machine
  - ✓ Launch DC cosim, EM check and dynamic cosim

## Step III: Running the script: run\_link\_siwave.py

- ⌘ First cd into the “Training\_testcase/CPA/RHSC\_CPA\_Flow
- ⌘ To run the first script:

```
% cd 'Training_testcase/CPA/RHSC_CPA_Flow'  
% redhawk_sc run_link_siwave.py
```

- ⌘ What does run.py do?
  - ✓ Import defs, lefs, libs, twfs and siwave CPA model
  - ✓ Launch workers on the local machine
  - ✓ Launch DC cosim, EM check and dynamic cosim

# Step IV : Result Exploration using Console (run.py)

✧ View the results in the console

% redhawk-sc -console

% Click CPA/CTA view icon

The screenshot displays the SeaScape gp.2 software interface. On the left, a tree view shows a project structure under the path `/nfs/sjocpspe1...C CPA Flow/db`. The main area on the right shows a circuit diagram with various components and connections. A red box highlights the 'Console' icon in the top toolbar, with an orange arrow pointing to it. Below the circuit diagram, a table lists the components and their properties.

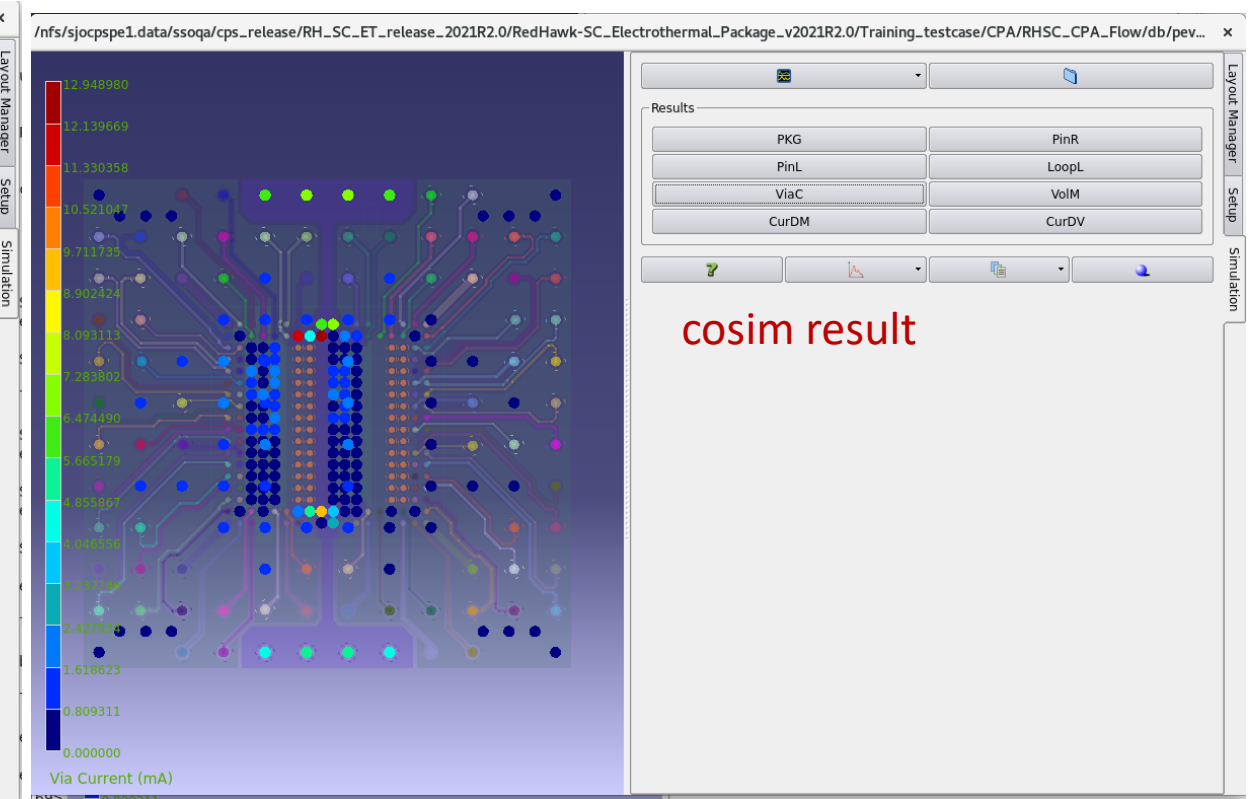
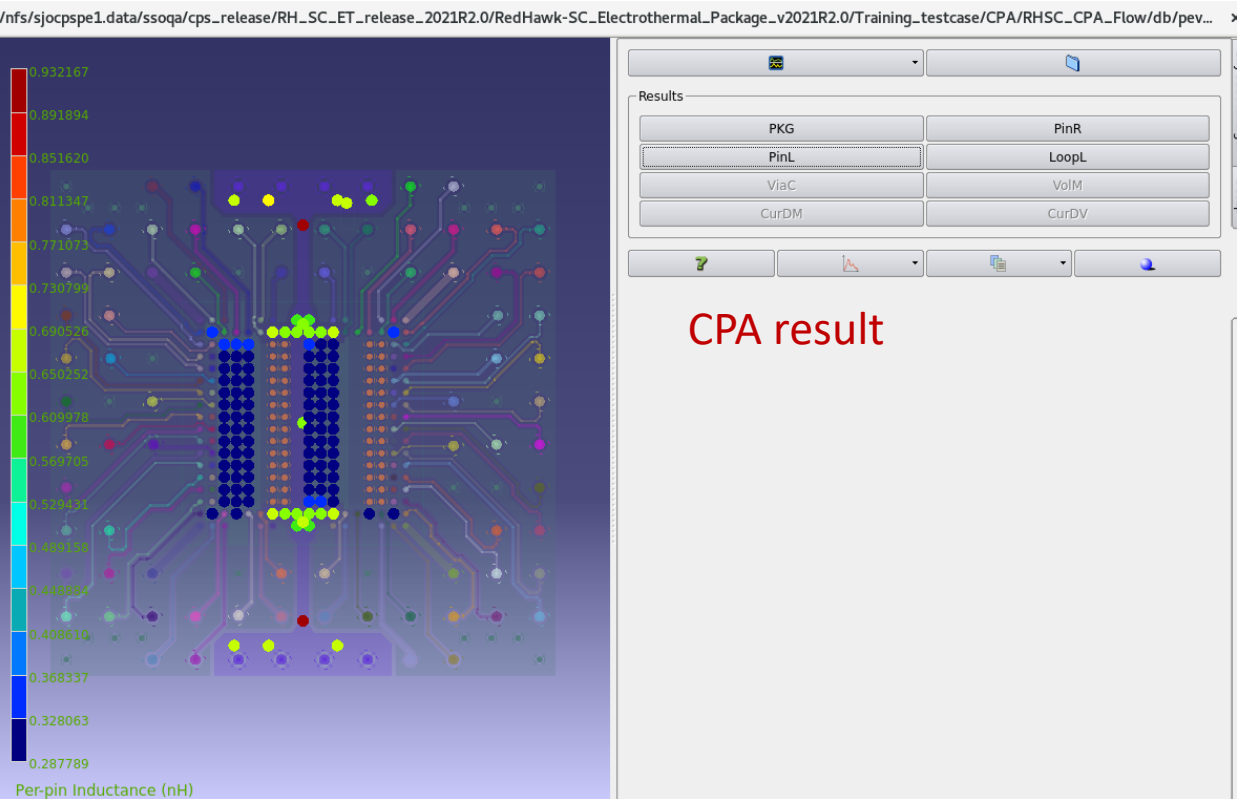
Net	Layer	Comp	Part	
1		VDD_15	Power	3 25 145
2		VSS	Ground	3 135 1665
3		FCHIP_A1	Signal	2 2 3
4		FCHIP_A12	Signal	2 2 4
5		FCHIP_A13	Signal	2 2 5
6		FCHIP_A16	Signal	2 2 7
7		FCHIP_A17	Signal	2 2 5

Below the table, a 'Value' section shows the properties of the selected component (VDD\_15):

Name	Value
Visible	<input checked="" type="checkbox"/>
Color	
Type	Power

# Step IV : Result Exploration using Console (run.py)

- ✧ View CPA result
- ✧ View DC cosim result

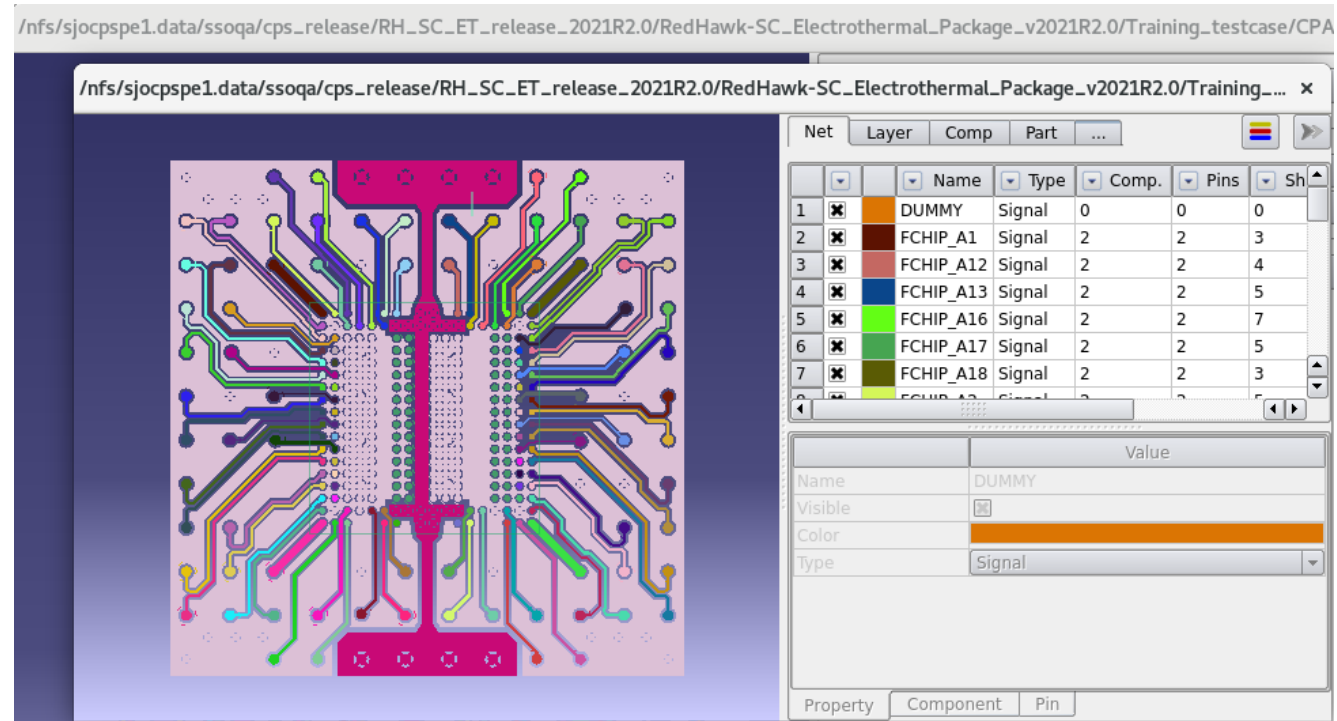
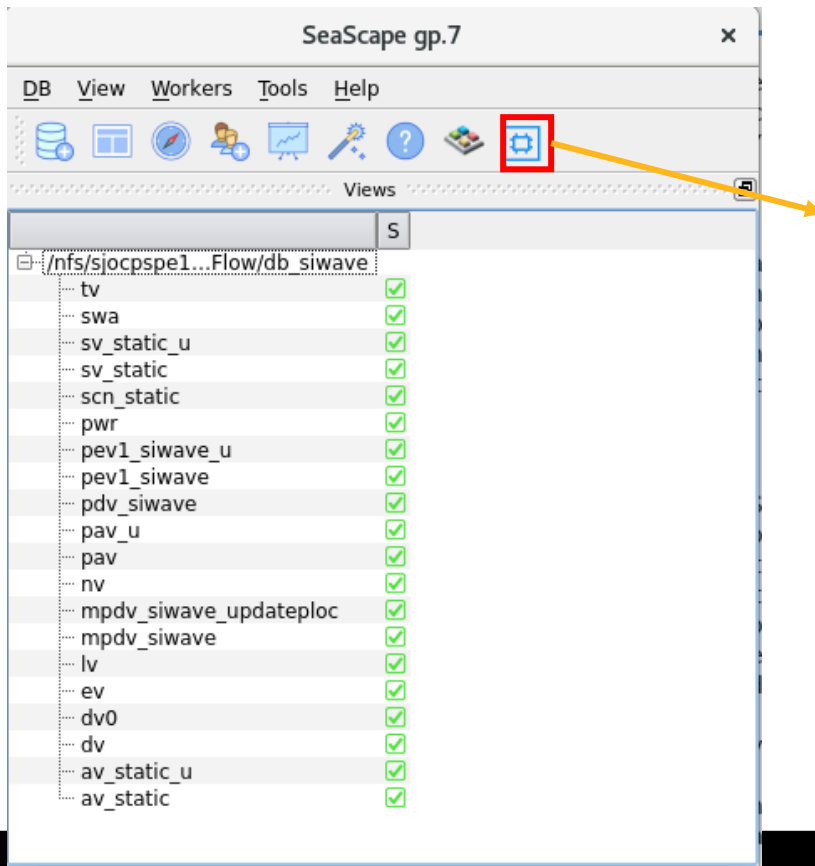


# Step IV : Result Exploration using Console (run\_link\_siwave.py)

❖ View the results in the console

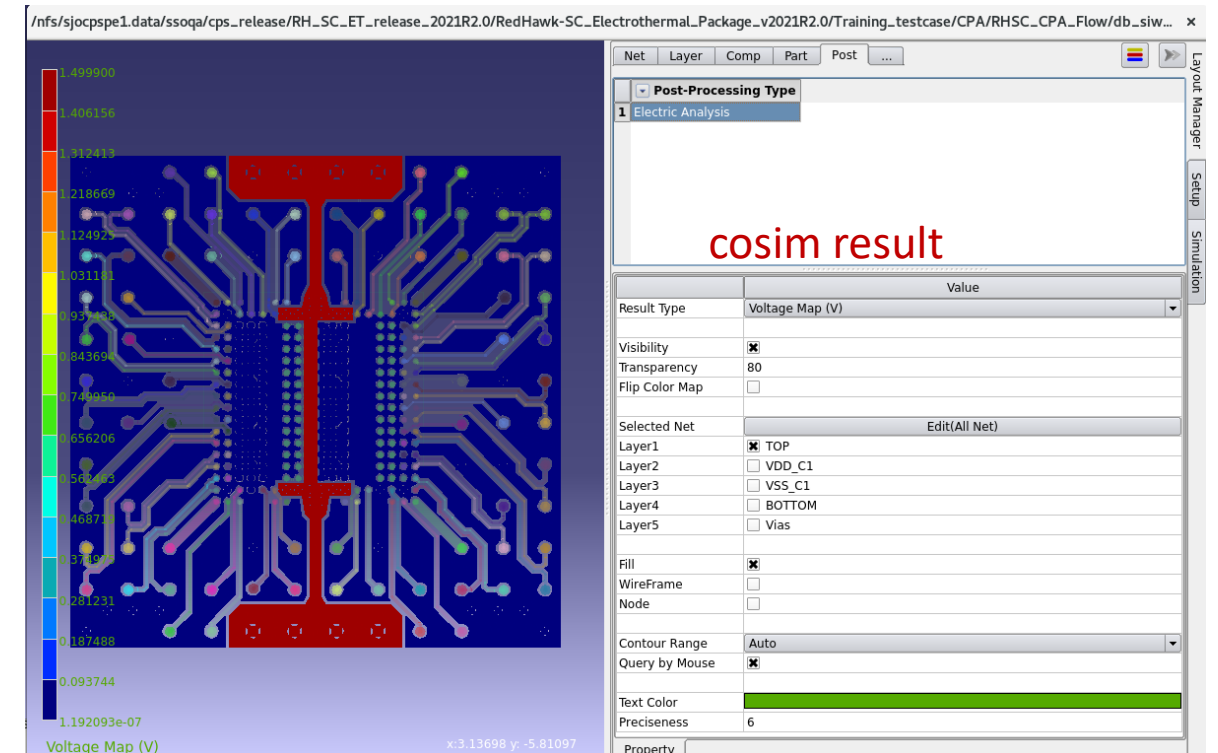
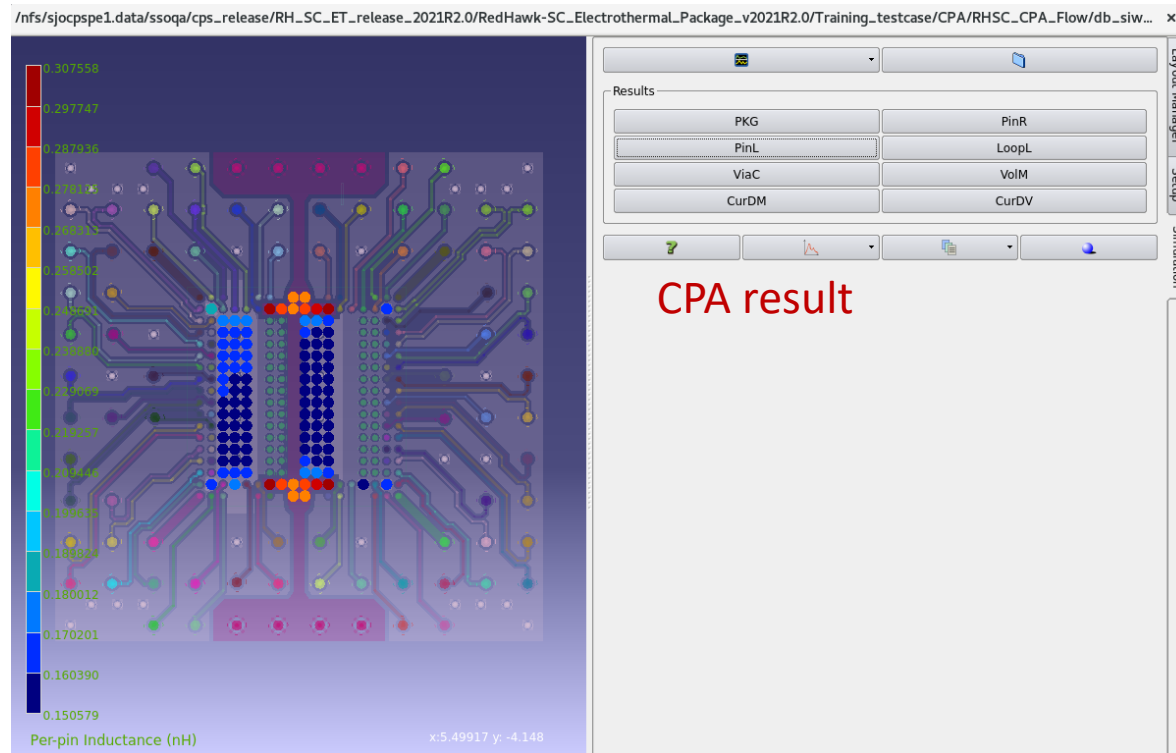
% redhawk-sc –console

% Click CPA/CTA view icon to open pev view



# Step IV : Result Exploration using Console (run\_link\_siwave.py)

- ✧ View CPA result
- ✧ View DC cosim result



 **Ansys**

