ANSYS Q3D Getting Started WS5.2

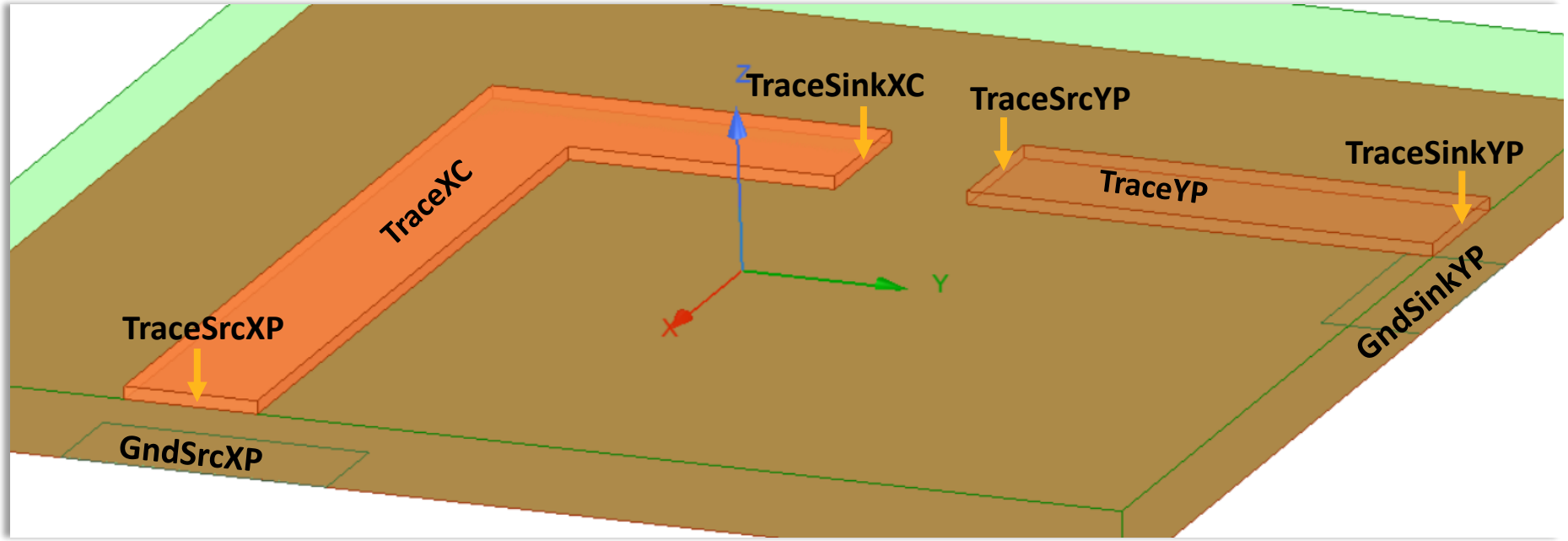
Workshop 5.1: Q3D MSbX Inductance Matrix Reduction

Release 2020 R1

Outline - MSbX *Capacitance Matrix Reduction*

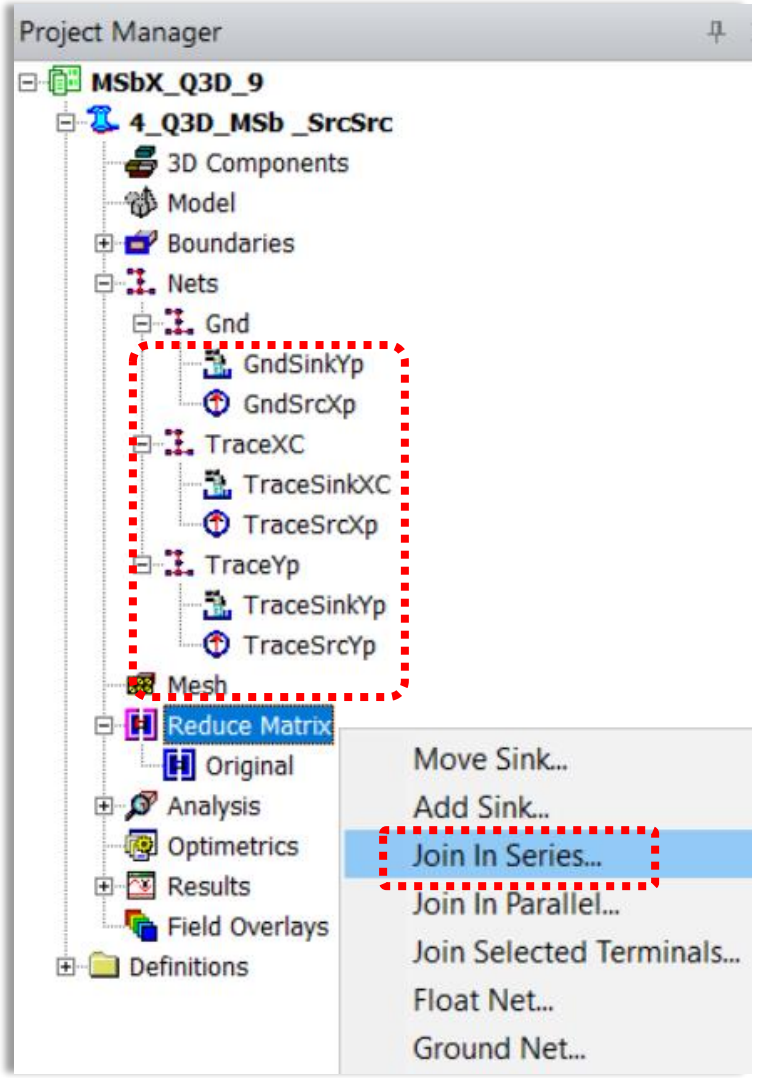
List of what this workshop will do:

- Open archived Q3D example - ***MSbX_Q3D_9.aedtz***
- Run simulation (if needed)
- ***Reduce Matrix - Join in Series > Return Path***
- ***Reduce Matrix- JoinSeries > Ground Net***
- Compare reduced matrices



Ansys

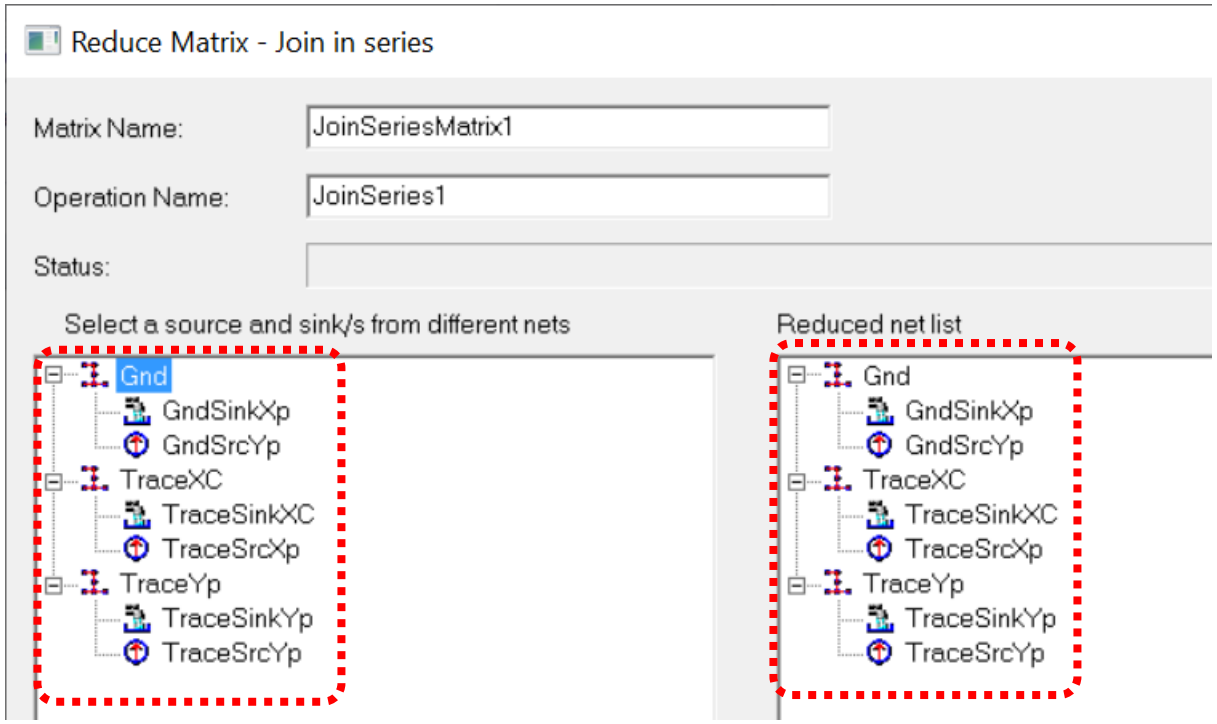
Bring Up *Reduce Matrix > Join in Series …*



In order to join the two microstrip sections in series across the gap …

- In the ***Project Manager***, right-click on ***Reduce Matrix*** and select ***Join in Series…*** to bring up the dialog window.

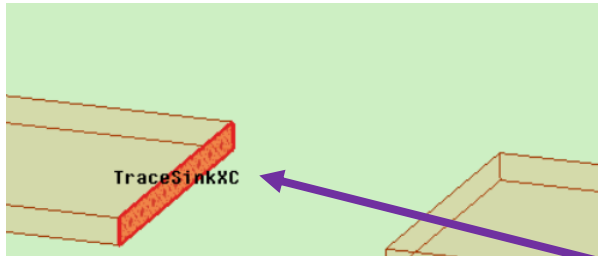
The starting point for the ***Reduce Matrix - Join in Series*** window reflects the ***Nets*** and Terminals we see in the ***Project Manager***.



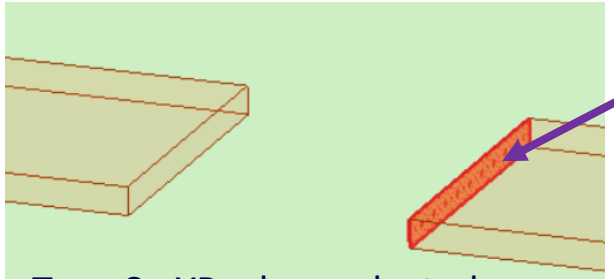
Select Terminals on Both Sides of the Gap

- In the ***Join in Series*** window, select the **TraceSrcYp** and **TraceSinkXC**, two terminals we wish to connect (use ***Ctrl***-click to multiple select).

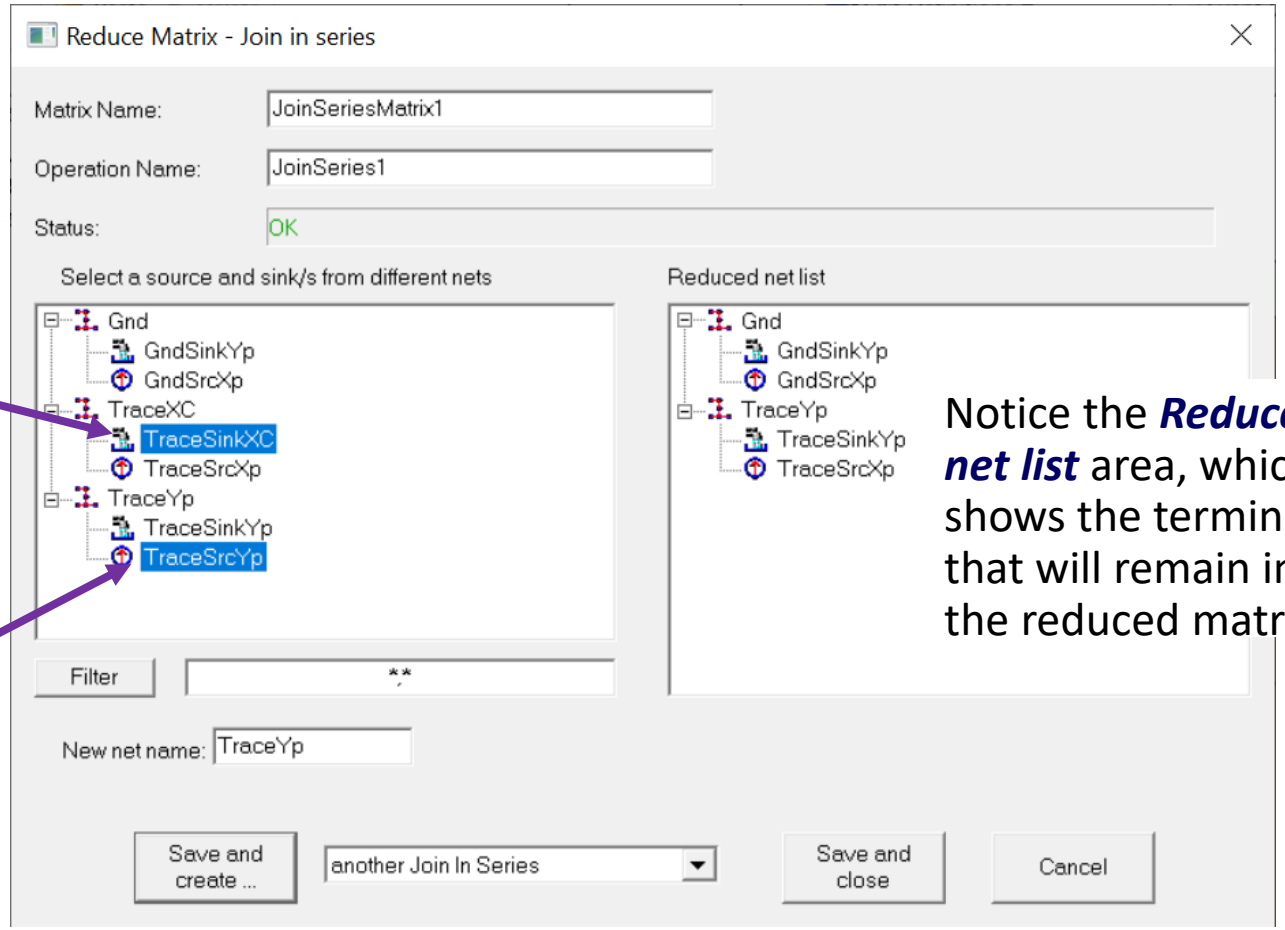
… continued … do not close …



TraceSinkXC when selected in the ***Project Manager***



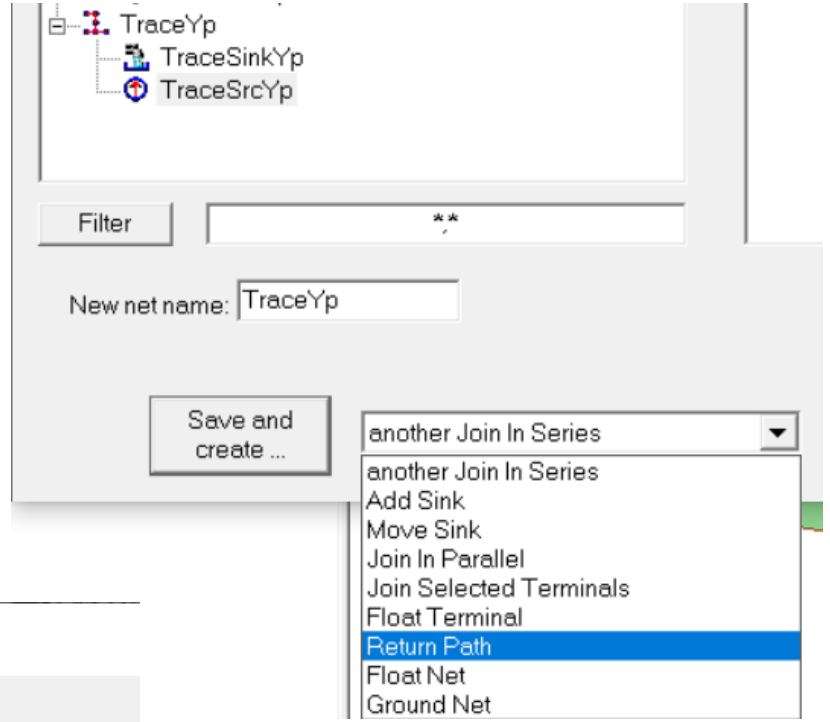
TraceSrcYP when selected in the ***Project Manager***

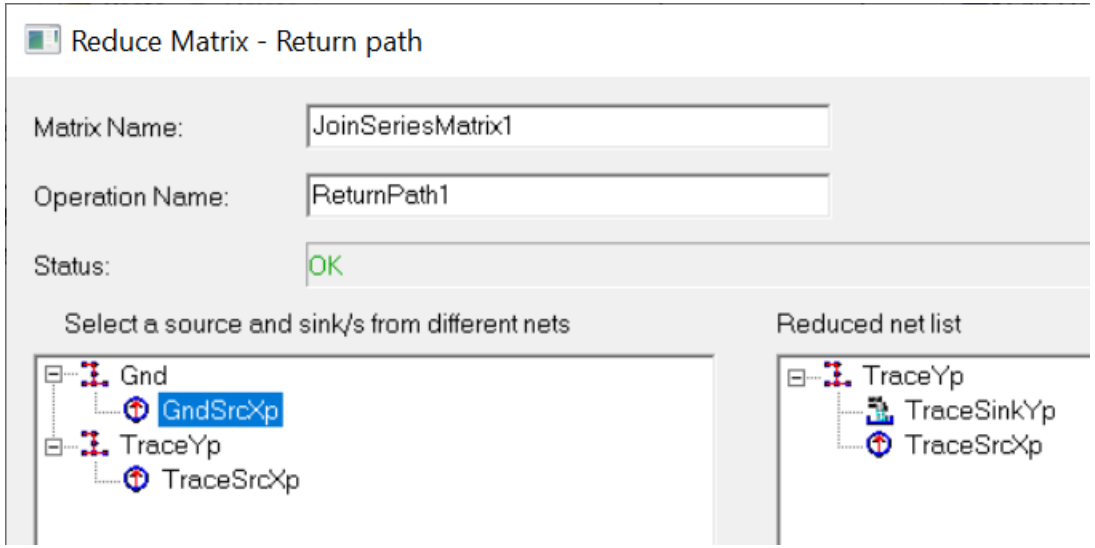


Notice the ***Reduced net list*** area, which shows the terminals that will remain in the reduced matrix.

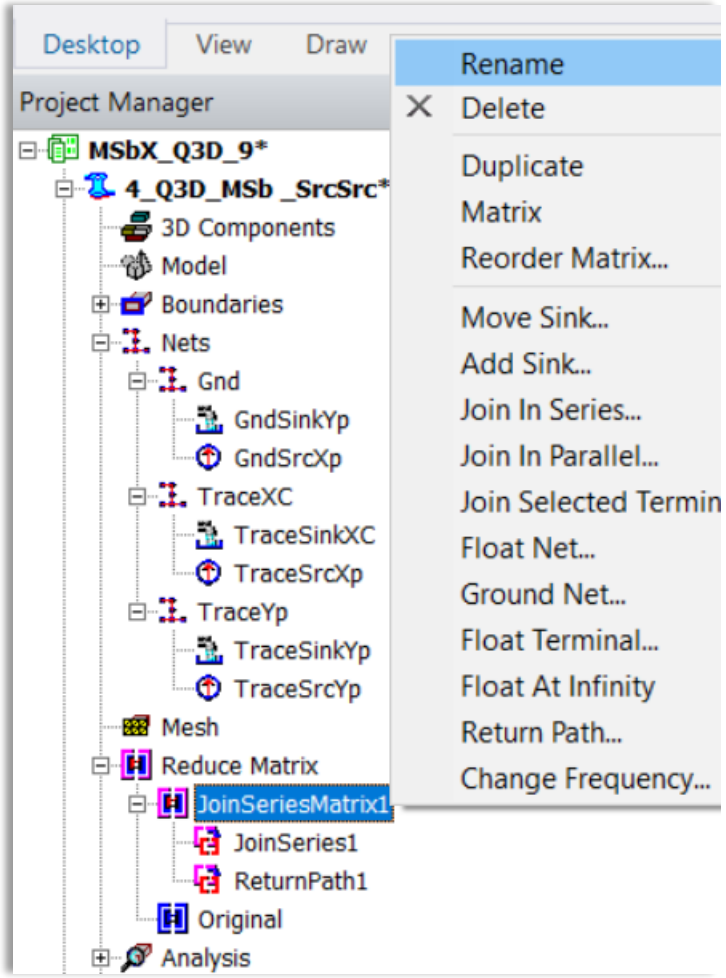
Return Path - Save and create …

- At the bottom of the ***Join in Series*** window, select the **Return Path**
- Click on **Save and create …** which changes
  over
  to the second
  Matrix Reduction - Return Path
- For the **Return Path** operation, select the ground source
- Click on **Save and close**

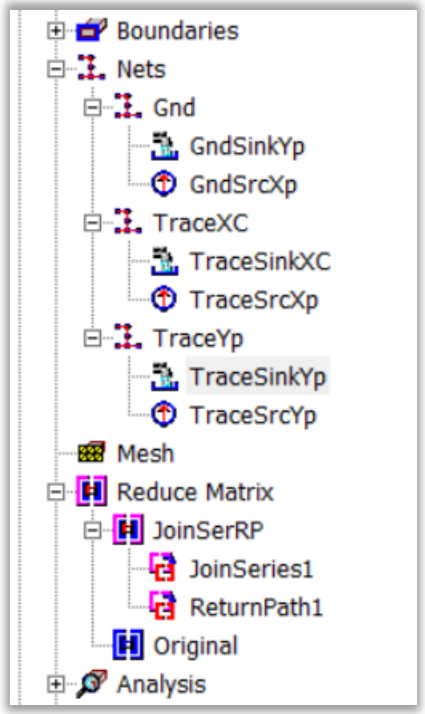




Join in Series > Return Path named JoinSerRP



- In the ***Project Manager***, under ***Reduce Matrix***, right-click on the new ***JoinSeries*** matrix and select ***Rename***.
- Change the name to **JoinSerRP**.
- Save the project.

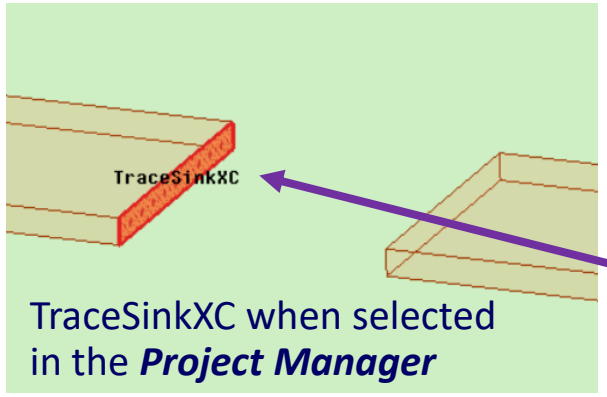


This completes the first of two reduced matrices that we will later compare.

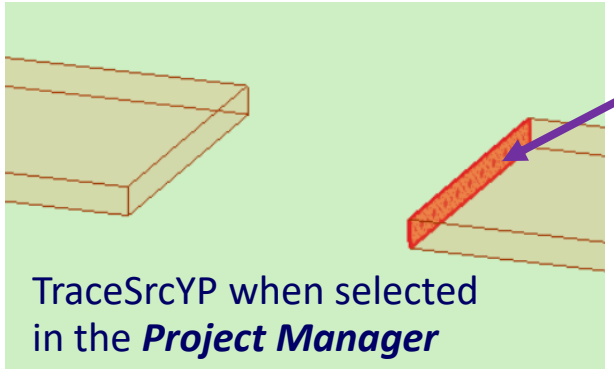
Initiate Second Join in Series Reduce Matrix Operation

- In the ***Project Manager***, right-click on ***Reduce Matrix*** to bring up the ***Reduce Matrix*** window.
- In the ***Join in Series*** window, select the **TraceSrcYp** and **TraceSinkXC**, Just as we did the first time.

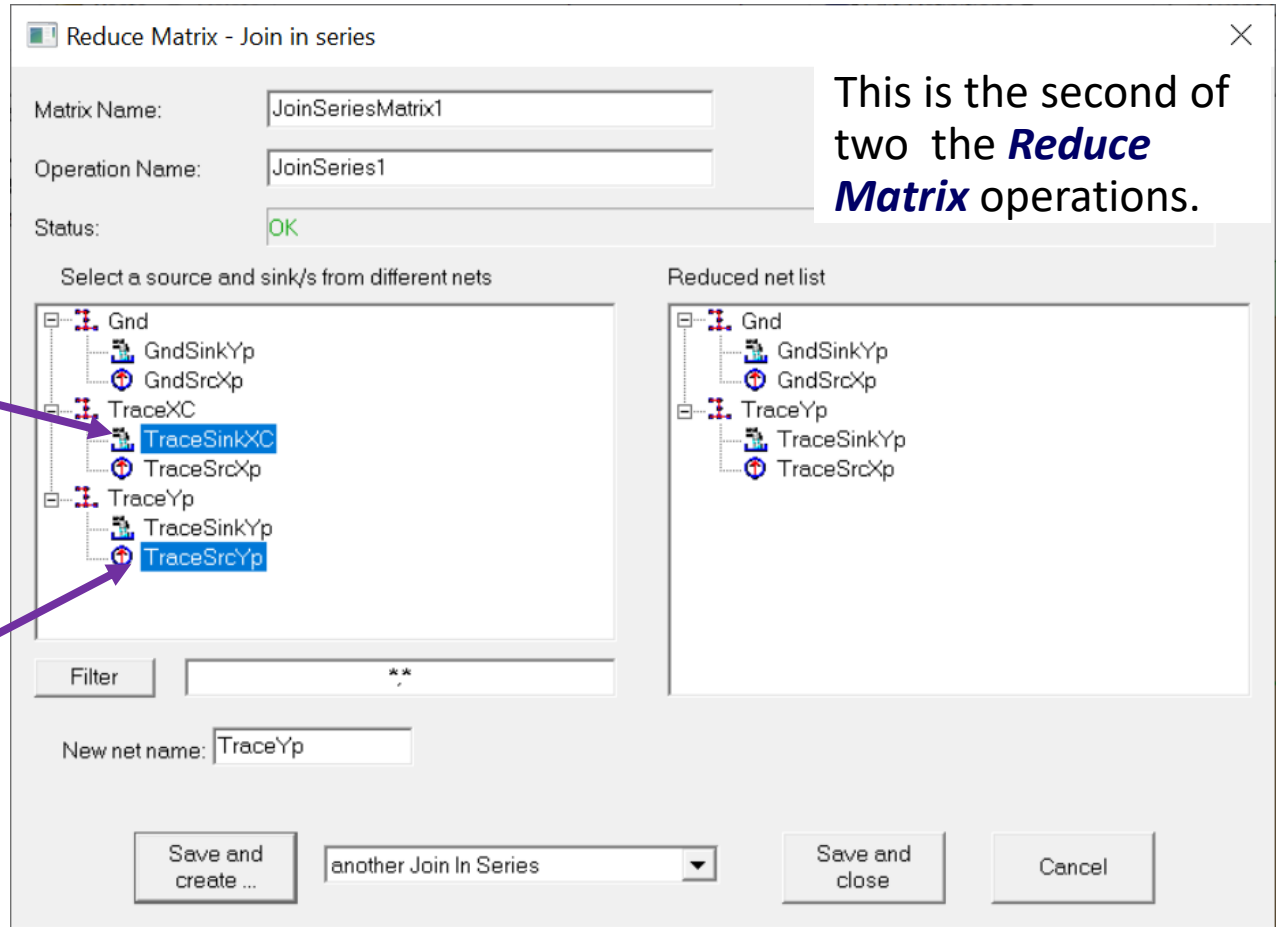
… continued … do not close …



TraceSinkXC when selected in the ***Project Manager***



TraceSrcYP when selected in the ***Project Manager***

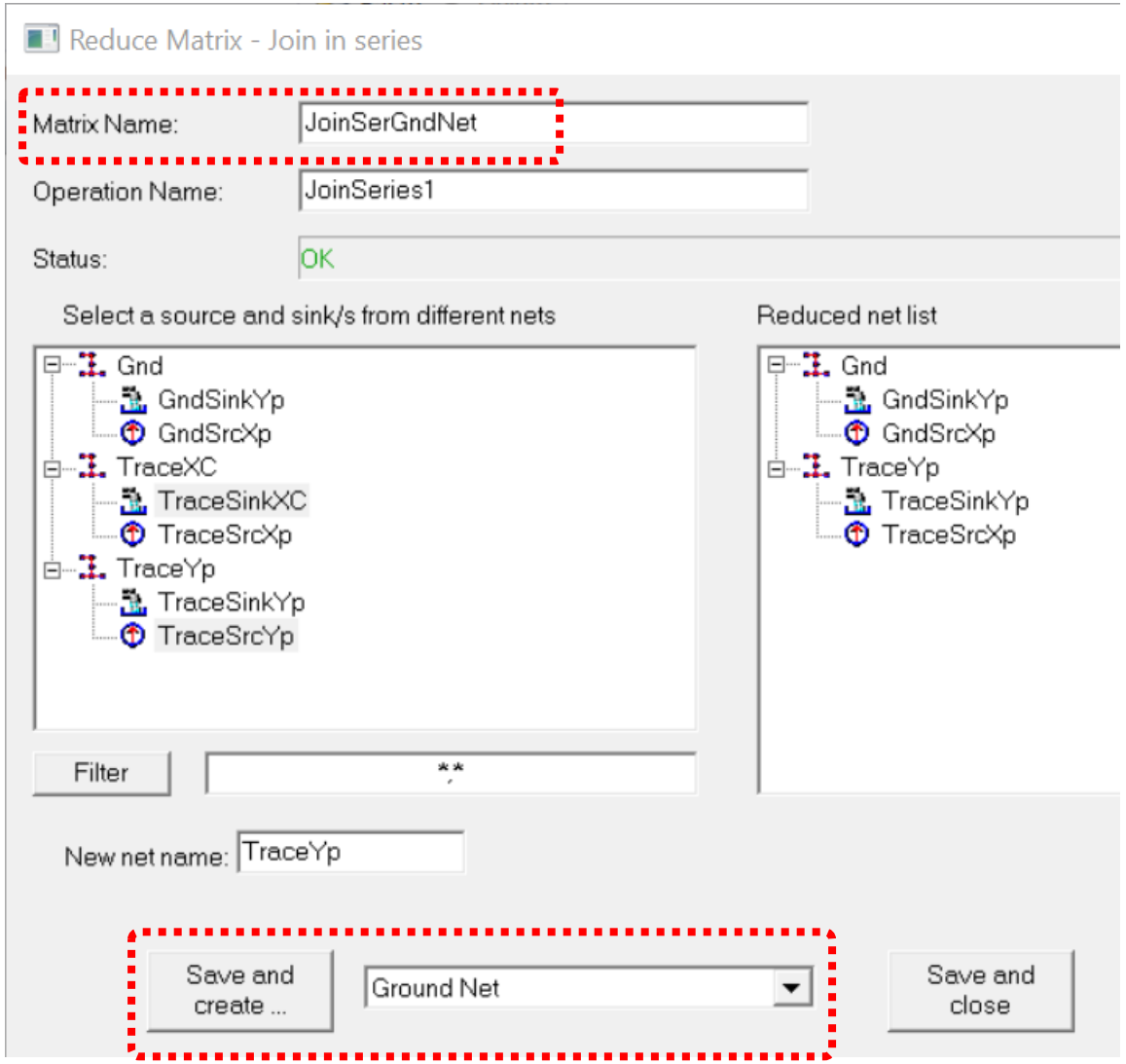


This is the second of two the ***Reduce Matrix*** operations.

Ground Net - Save and create …

- At the top, change the ***Matrix Name***: to **JoinSerGndNet.**
- At the bottom, select ***Ground Net.***
- Click on **Save and create …**

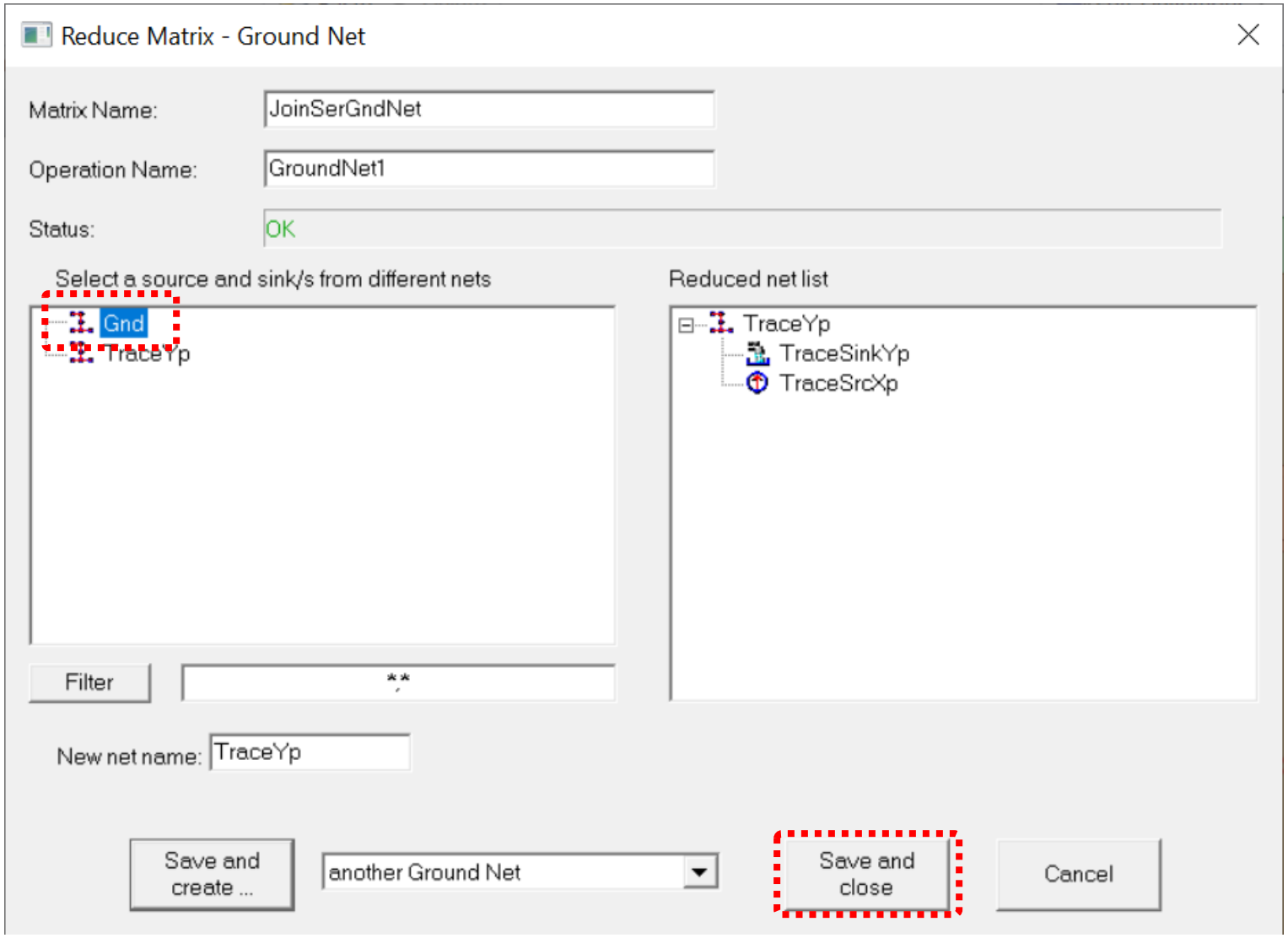
… continued … do not close …



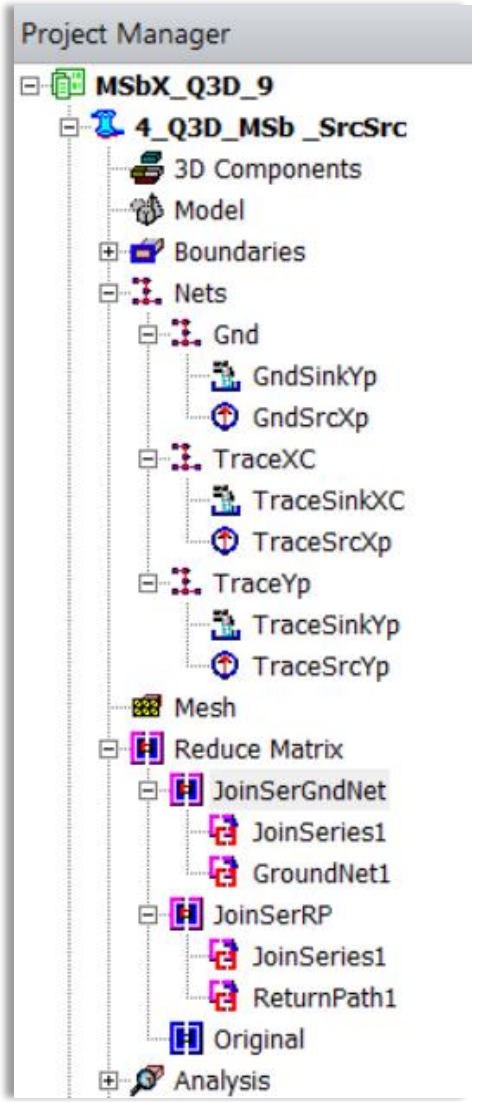
Choose *Ground Net - Save and close*

- Select **Gnd** for the ground net.
- Click on **Save and close.**
- Save the project.

Notice how this time we're selecting the ***Matrix Name*** while we're creating it.

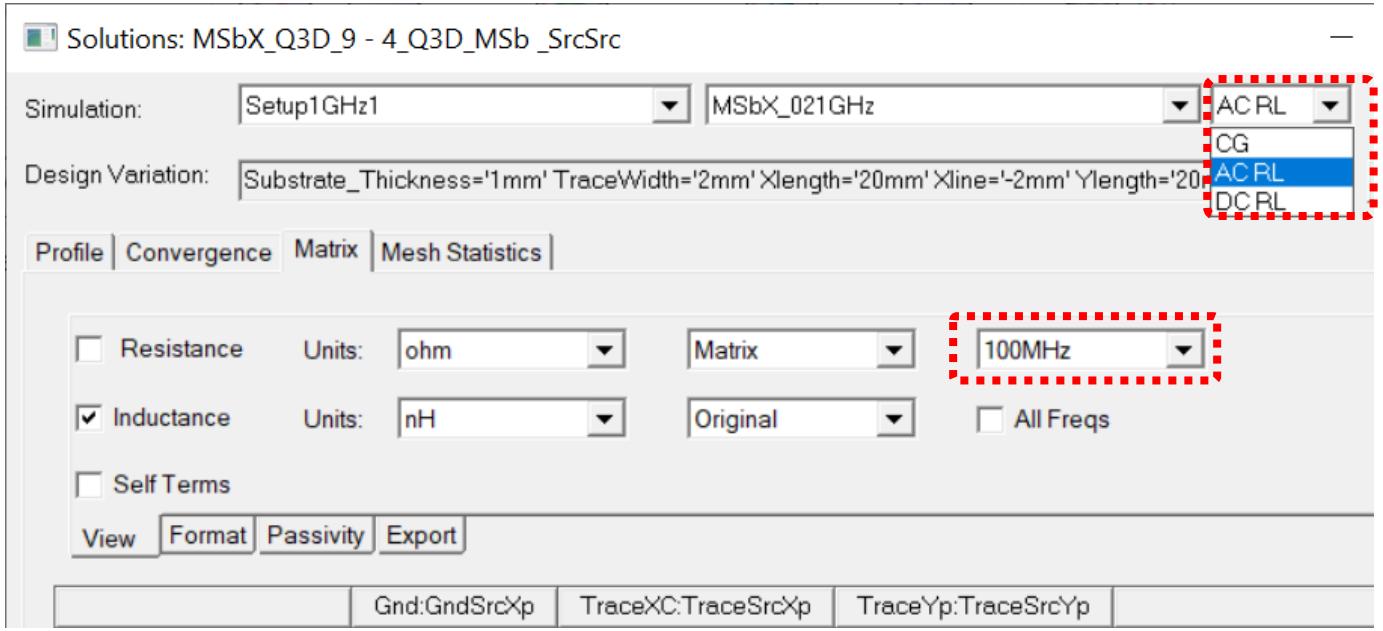


View *Solution Data - AC RL* @ 100 MHz



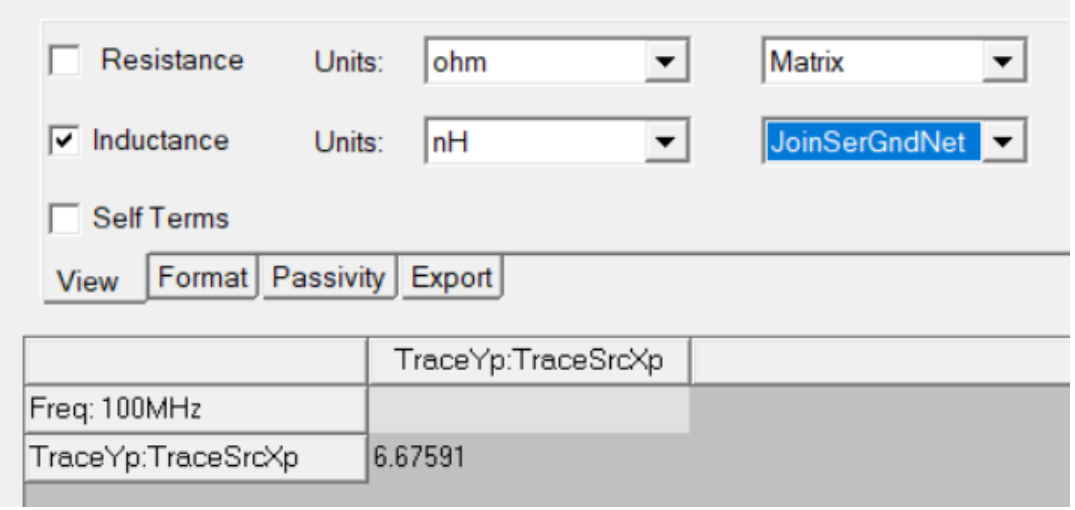
- In the ***Ribbon***, in the Results tab, click on ***Solution Data***

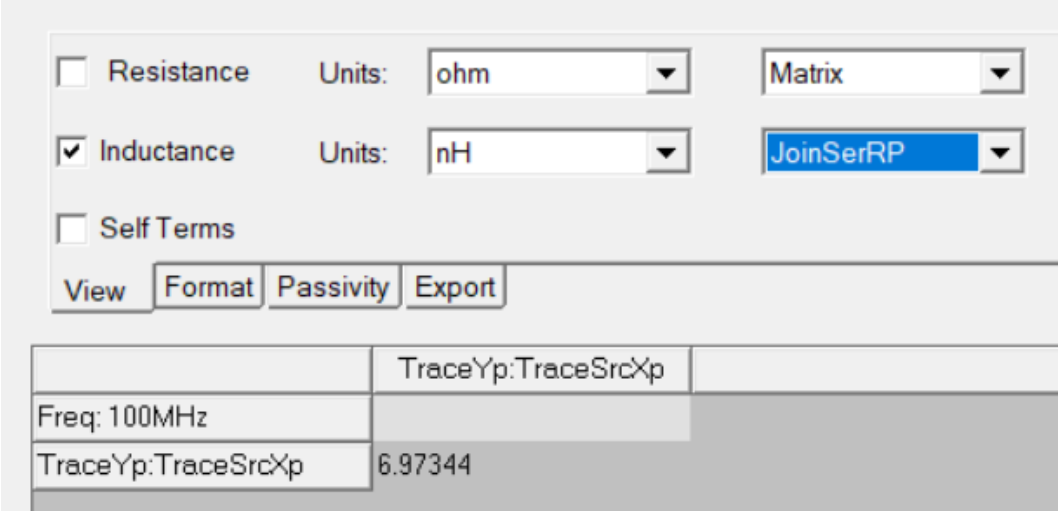
- Select ***AC RL*** and **100 MHz**



Compare *Return Path* to *Ground Net*

- Select each of the two compound ***Matrix Reductions*** and compare.





Ground Net is more idealistic; it doesn't include any inductance from the ground plane current. Return Path pushes current through the return path conductor; there is a current going through the ground plane object. We expect Ground Net to be smaller.

End of Presentation