Please use the following link to download the Spectral Efficiency (SE) and Tandem Performance calculators: https://github.nrel.gov/Tandems/SE-and-Tandems . Please read the readme file carefully for detailed instructions on how to download and use it.

To run the SE and Tandem Performance calculators successfully, please install the iv_param using pip install iv-params in the same directory as the downloaded SE and Tandem Performance calculators file, and for additional information, refer to the following link: https://github.com/NREL/iv_params#readme

Here's an example of Tandem Performance calculator.

Short Guidance: Users can upload input files (calculated SE files) from anywhere on their computer into the Tandem Performance GUI, however the calculated SE files from the SE calculator are saved in the calculatedSE folder. When computing 4T or 2T tandem efficiency, the user should choose one of three coupling methods. The calculated tandem efficiency files and the image will be saved in the tandems_data and tandems_image folders, respectively. For complete instructions on installing and using the Tandem Performance calculator, please read the readme file.

For ideal coupling method, select Ideal coupling, cutoff at top cell bandgap from the dropdown menu.

Layout of the Tandem Performance calculator, and 4T tandem output with ideal coupling

Note: Coupling methods are used to estimate the spectral efficiency of top and bottom cells in a 4T Tandem

```
4T Tandem
Coupling Method: ideal
light transmitted onto bottom cell: 100 %
Top Cell is Top_cell_calculatedSE
Bandgap of Top Cell: 1.7eV
Top limiting efficiency = 18.96 %
Bottom Cell is Bottom_cell_calculatedSE
Bottom limiting efficiency = 13.13 %
The tandem efficiency for Top and Bottom is 32.09 %
The results are saved in the 'tandems_data' folder and the file name is: 4T_tandem data_Top_cell_calculatedSE+Bottom_cell_calculatedSE+idea
l+100_8
```

```
4T Tandem Efficiency of Top_cell_calculatedSE_and_filtered_Bottom_cell_calculatedSE: 32.08
----------------------------------------------------------------
```

Layout of the Tandem Performance calculator, and 2T tandem output with ideal coupling

```
Top cell Jsc from Top_cell_calculatedSE's QE is 18.85 mA/cm^2
Bottom cell Jsc from filtered Bottom_cell_calculatedSE's QE is 20.68 mA/cm^2
```

Note: Coupling methods and the lower Jsc of either cell are used to estimate the spectral efficiency of top and bottom cells in a 2T Tandem

2T Tandem
Coupling Method: ideal
light transmitted onto bottom cell: 100 %
Top Cell is Top_cell_calculatedSE
Bandgap of Top Cell: 1.7eV
Top limiting efficiency = 18.96 %
Bottom Cell is Bottom_cell_calculatedSE
Bottom limiting efficiency = 11.96 %
The tandem efficiency for Top and Bottom is 30.92 %
The results are saved in the 'tandems_data' folder and the file name is: 2T_andem data_Top_cell_calculatedSE+Bottom_cell_calculatedSE+idea l+100_9

```
2T Tandem Efficiency of Top_cell_calculatedSE_and_Bottom_cell_calculatedSE: 31.79

------------------------------------------------------------------------
```