```
## PLOTING X-RAY EXCITED OPTICAL EMISSION DATA ##
## Creates an object named XEOL to load XEOL DATA, EITHER TOTAL OR SUMMED OVER SPECIFIC ENERGIES
XEOL = XEOLLoader()

## LOADING/ADDING/SUBSTRACTING XEOL DATA FROM A FILE ##
## Loads XEOL scans data from HDF5 file
XEOL.load(config,'filename', 'detector', *args, **kwargs)
## *args = comma seperated list of scans to be plotted or added and then plotted

## Loads and sums XES scans data from HDF5 file
XEOL.add(config,'filename', 'detector', *args, **kwargs)
## *args = comma seperated list of scans to be plotted or added and then plotted

## Loads and subtratcs XES scans data from HDF5 file
XEOL.subtract(config,'filename', 'detector', *args, **kwargs)
## *args = s1, p1 -> The data from p1 is subtracted from s1
## *args = [s1, ..., sn], [p1, ..., pn] -> The sum of p1..pn is sub. from the sum s1...sn

## Loads and subtract scan from all previously loaded scans
XEOL.background(config,'filename', 'detector', *args, **kwargs)
## *args = s1 -> The scan to be subtracted from all previous load/add/subtract actions
## *args = [s1, ..., sn] -> The sum of scans s1..sn to be subtracted from all previous load/add/subtract actions

## REQUIRED VARIABLES ##
## config = RIXS          -> RIXS Endstation
## config = RSXS          -> RSXS Endstation
## filename = hdf5 file   -> Extension .h5 not needed
## xeol_stream            -> sums all data from MCA type detector
## xeol_stream[Start:End] -> sums all MCA data within excitation energy range
## NOTE: Simple math allowed with xes_stream with contstants and variables, i.e. +, -, /, *

## **kwargs ##
## norm = True                        -> Scales the data such that its range is 0 to 1.
## twin_y = True                      -> Adds these plots to a secondary scale
## xoffset = [(S1,P1),...,(SN,PN)]    -> Adjusts x-axis scale to map SN to PN
## xcoffset = value                   -> Shifts x-axis scale by a constant value
## yoffset = [(S1,P1),...,(SN,PN)]    -> Adjusts y-axis scale to map SN to PN
## ycoffset = value                   -> Shifts y-axis scale by a constant value
## grid = [start,stop,delta]          -> Change x-axis grid to be uniform
## savgol = (wind len, poly ord, derv) -> Smooths and takes derivative
## binsize = bins                     -> Bins data, specify the number of points (extra points removed)


## SET RANGE OF Y and X VALUES ##
XEOL.xlim(min, max)
XEOL.ylim(min, max)
## NOTE: These ranges will be preserved in the data export

## PLOTTING SCAN DATA ##
XEOL.plot(**kwargs)

## **kwargs ##
## title = 'New Title of plot' -> Replaces default title with user defined
## xlabel = 'x-axis label'     -> Replaces default x-axis label with user defined
## ylabel = 'y-axis label'     -> Replaces default y-axis label with user defined
## plot_height = value         -> The plot height in points, default is 600
## plot_width = value          -> The plot width in points, default is 900
## norm = True                 -> Normalizes all the data between 0 and 1
## waterfall = offset          -> Normalizes as above and shifts each by the offset

## EXPORTING PLOT DATA ##
XEOL.export('filename', **kwargs)

## REQUIRED VARIABLES ##
## filename = filename to be used for ASCII file, do not add extension
## NOTE: Data is exported as it displayed, only options in plotting methods are ignored.

## **kwargs ##
## split_files = True -> Saves each data stream with number appended to the filename
```
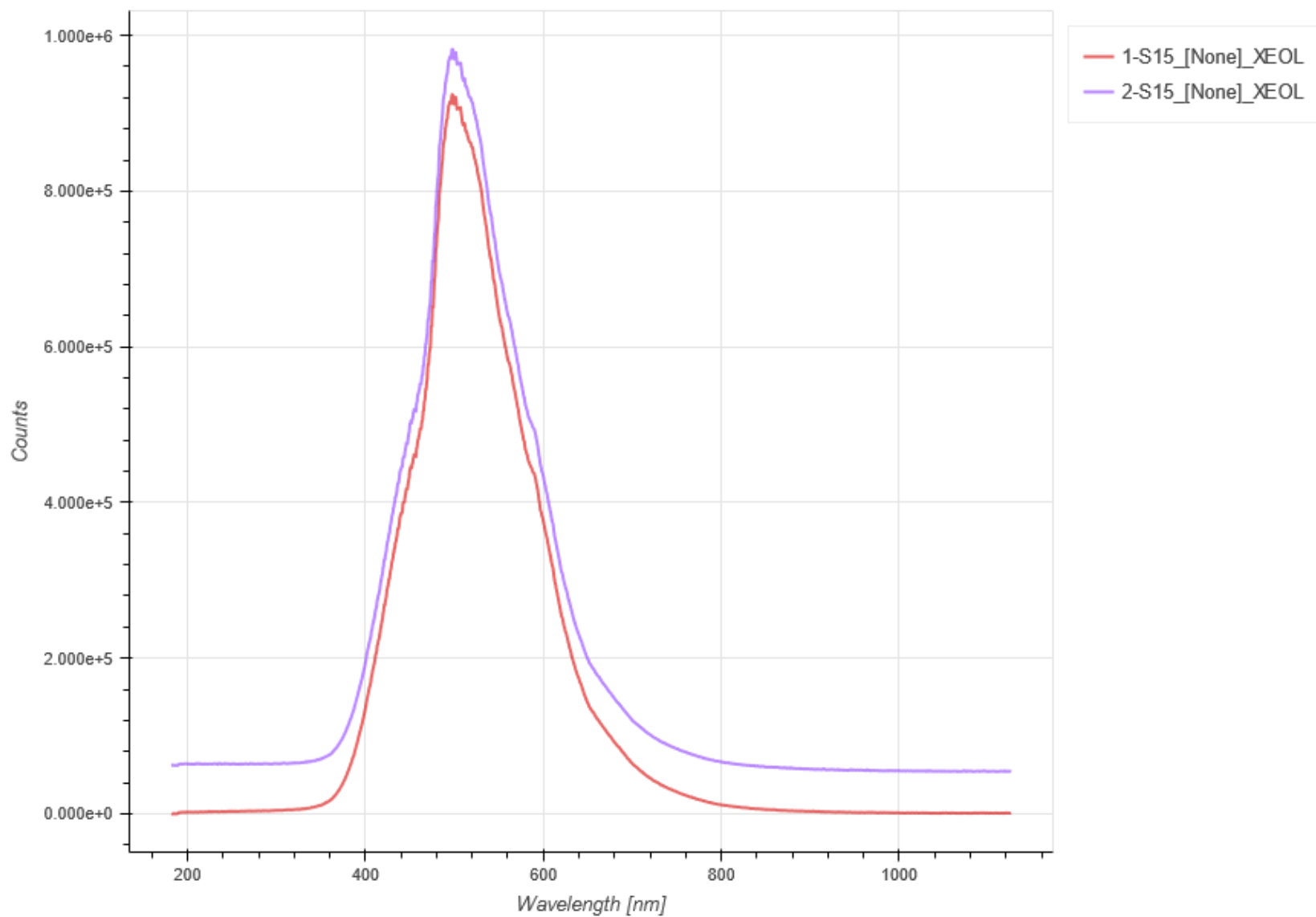
```
## XEOL Spectra from BGO
BGO_XEOL = XEOLLoader()
BGO_XEOL.load(RIXS, 'HDF5_Notebook', 'XEOL',15)
## Need to scale the background by exposures
BGO_XEOL.background(RIXS, 'HDF5_Notebook', 'XEOL/50*20', 16)
## Add in spectra with background substraction
BGO_XEOL.load(RIXS, 'HDF5_Notebook', 'XEOL',15)
BGO_XEOL.plot()
BGO_XEOL.export('BGO_XEOL')
```

```
## XEOL Spectra from hBN
hBN_XEOL = XEOLLoader()
hBN_XEOL.load(RIXS, 'HDF5_Notebook', 'XEOL',23)
## Need to scale the background by exposures
hBN_XEOL.background(RIXS, 'HDF5_Notebook', 'XEOL/5*10', 24)
## Add in spectra with background substraction
hBN_XEOL.load(RIXS, 'HDF5_Notebook', 'XEOL',23)
hBN_XEOL.plot()
hBN_XEOL.export('hBN_XEOL')
```