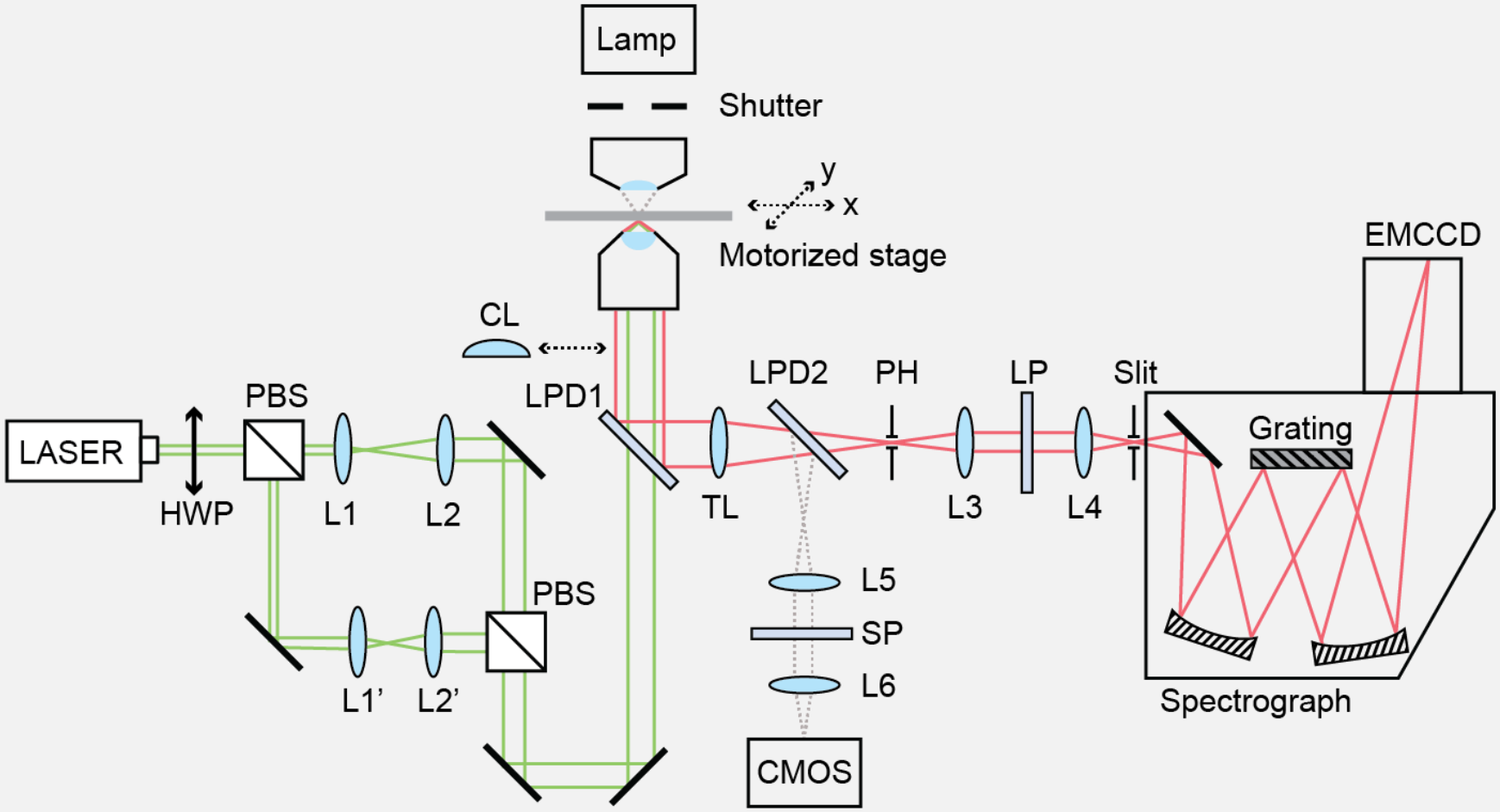
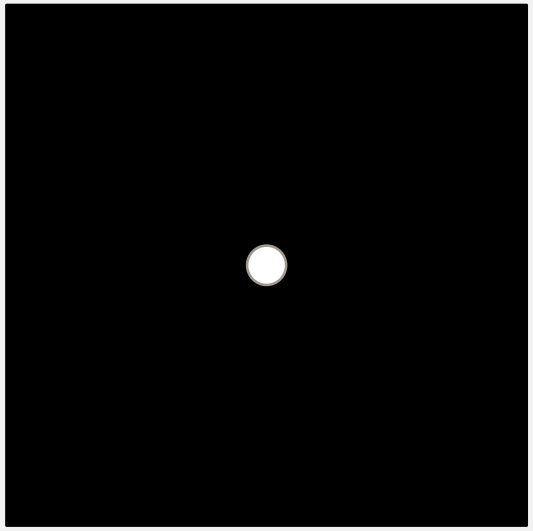
OPTICS SCHEMATICS

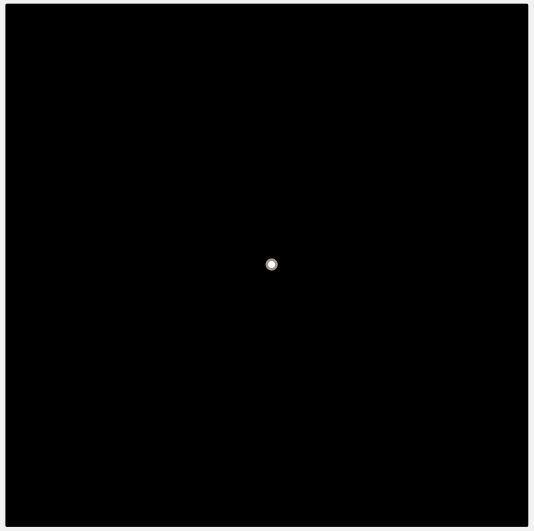


THREE ILLUMINATION PATTERNS



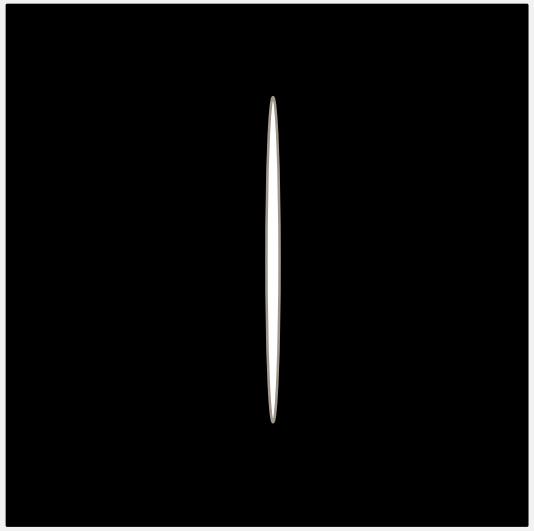
Single cell illumination

- ~8um
- Ideal for single cell measurement
- covers 1/3 of a cell
- 300um pinhole



PSF illumination

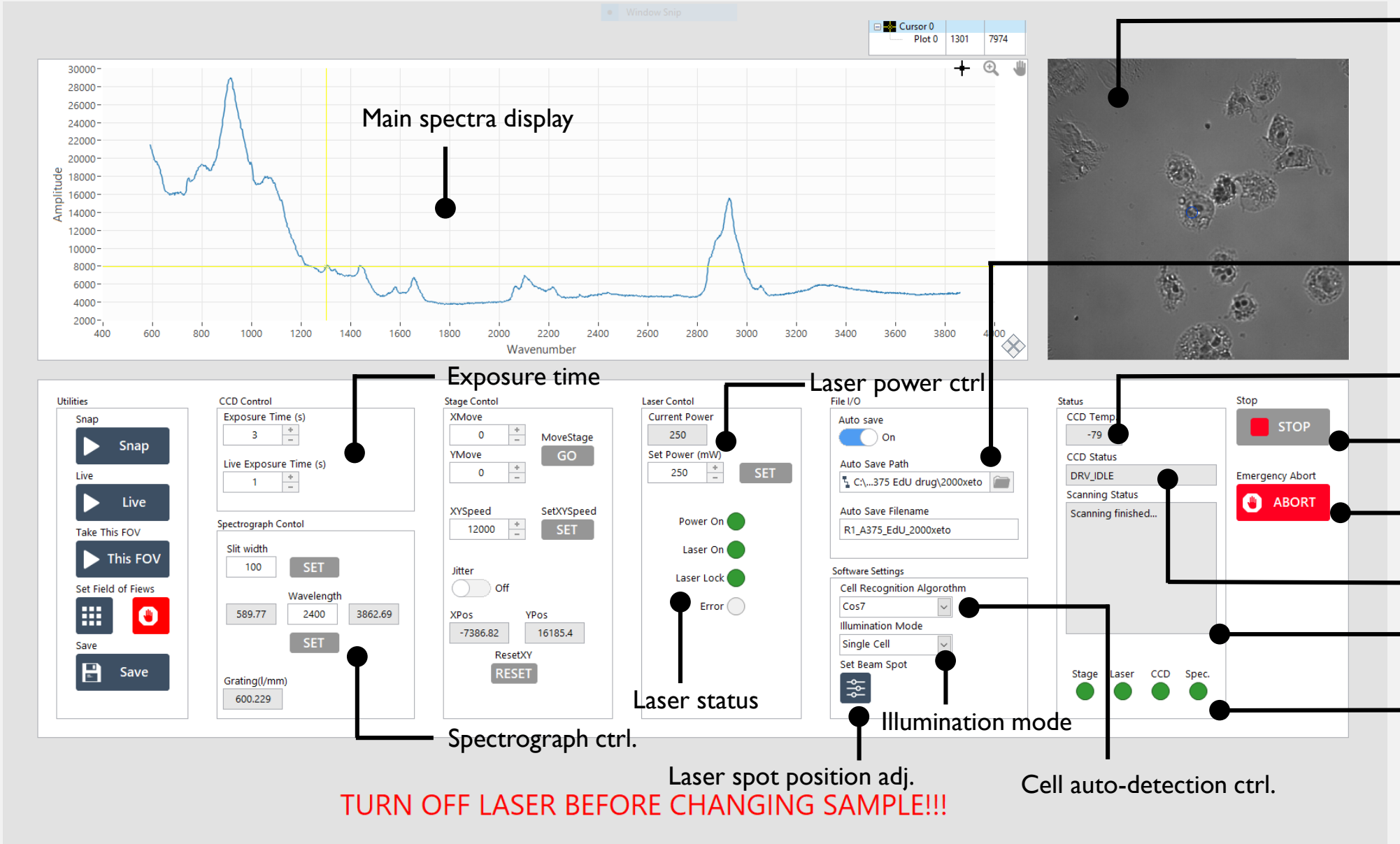
- ~300nm
- Ideal for scanning



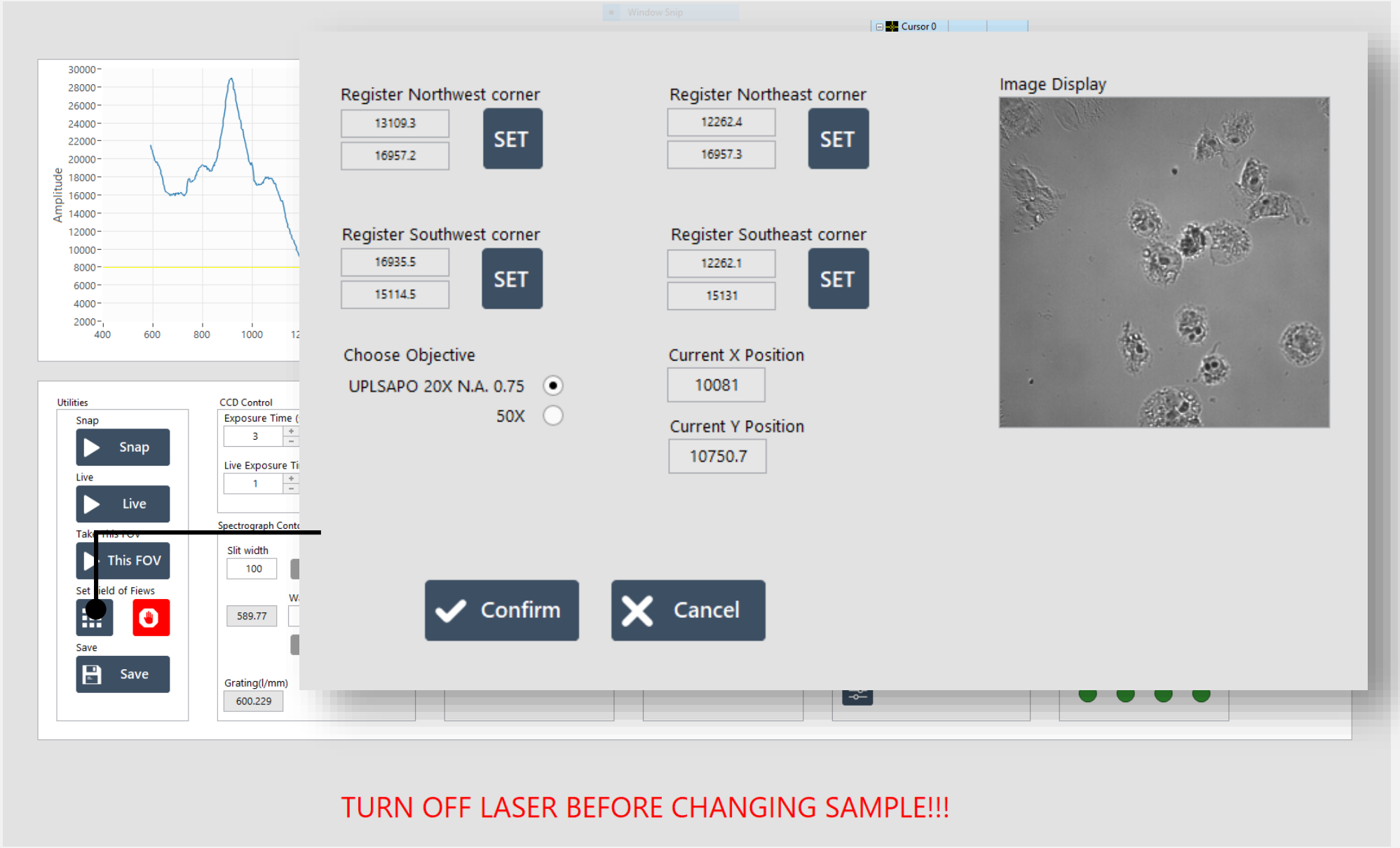
Linear illumination

- ~8 by 80um
- Ideal for bulk measurement
- Optically ‘averages’ multiple cells
- Without pinhole

RASPECTRA FRONT PANEL

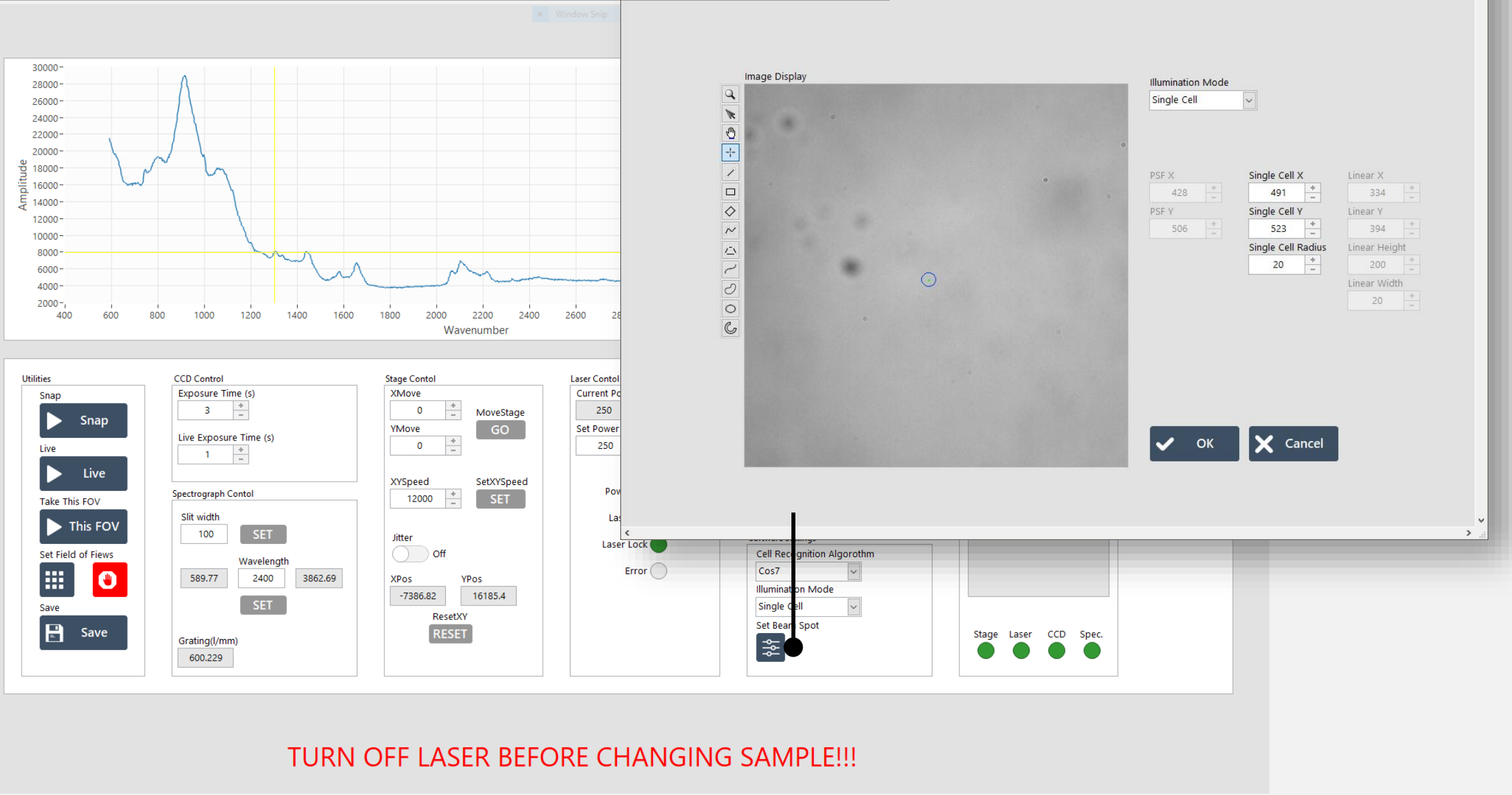


RASPECTRA SETTING SCANNING RANGE



TURN OFF LASER BEFORE CHANGING SAMPLE!!!

RASPECTRA SETTING BEAM POSITION



TURN OFF LASER BEFORE CHANGING SAMPLE!!!

SPECR 3.0 CLASS

```
Class specr
    -properties
        .data
            .wavenum      %wavenumber
            .spc          %spectral data
            .bgcor        %fitted bkgrd
            .removed      %removed data
        .label
            .propertyName
            .propertyValue
            .filename
            .cellType
            .probes
            .treatment
            .history
        .stats
            .spcMean
            .spcStd
            .spcResolution
            .spcSNR
            .cellNum
```

```
Class specr
    -methods
        %% data management
        .specr()
        .importdata()
        %% plots
        .plot()
        .plotMean()
        %% preprocessing
        .removeBg()
        .removeOutliner()
        .removeLowSNR()
        .trim()
        .normalize()
        .calibrate()
        .delete()
        %% utilities
        .setLabel()
        .getMean()
        .getSNR()
        .getNum()
```

SPECR 3.0 FUNCTIONS

Auxiliary functions:

```
%% core functions
spcinitialize() %initialize properties fields
spcuiimport()   %select data with GUI
spcuiopen()     %open files with GUI
spcsort()       %sort spectra
spcgetid()      %find ID using regexp
spcisfield()    %if input is a valid field
spcfindregion() %find index given wavenumber
spcnormalize()  %basic function for normalization
spctrim()       %basic function for trimming
spcknneval()    %evaluate accuracy with knn model

%% data management
spcmerge()      %combine two specr objects
spcmergedata()  %combine two specr objects
spcsplitdata()  %split data for training and testing
spcstack        %stack arrays

%% bkgrd correction
spcbgsub()      %fit baseline with various model

%% plots
spcplot()       %plot spectral data
spcmarkpeaks()  %mark common peaks on the plot
spcploterrorellipse() %mark 2D error bar

%% calibration
spcpksfit()     %fit peaks with various model
spccalibstd()   %calibrate with standard samples
spcfindstdpks() %detect peaks with parameters
```