



MaNGA Data Analysis with Marvin

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Create Maps, Cube, or ModelCube Object

```
from marvin.tools.maps import Maps
maps = Maps('8485-1901')
Specify plateifu, mangaid, or path to file.
```

```
from marvin.tools.cube import Cube
cube = Cube('1-209232')
Specify plateifu, mangaid, or path to file.
```

```
from marvin.tools.modelcube import ModelCube
modelcube = ModelCube('manga-8485-1901-LOGCUBE-SPX-GAU-MILESHC.fits.gz')
Specify plateifu, mangaid, or path to file.
```

Downloading

```
from marvin import config
config.download = True
Global switch to download Maps, Cube, and ModelCube files.
```

```
cube = Cube('8485-1901', download=True)
Download single object (also works for Maps and ModelCube).
```

```
from marvin.utils.general import downloadList
galaxies = ['8485-1901', '7443-12701']
downloadList(galaxies, dtype='cube')
Batch download cubes, images, maps, or RSS files.
```

Maps & Map

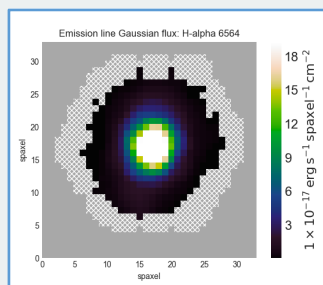
```
maps.datamodel
List all properties (+ channels) in a Maps.
```

```
ha = maps.emline_gflux_ha_6564
nii = maps['emline_gflux_nii_6585']
Get a Map with dotted or key syntax.
```

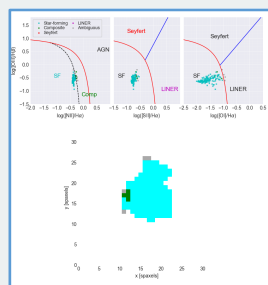
```
ha.value
ha.ivar
Get map values or inverse variances.
```

```
nii / ha**2
Do map arithmetic (+, -, *, /, or **).
```

```
maps.getCube()
maps.getModelCube()
Get Cube or ModelCube from a Maps.
```



ha.plot()



maps.get_bpt()

Cube & ModelCube

```
cube.flux.value
cube.flux.ivar
Flux and inverse variance of spectral cube.
```

```
modelcube.binned_flux.value
modelcube.binned_flux.ivar
Binned flux and inverse variance of spectra fit by DAP.
```

```
modelcube.full_fit.value
Get model fit.
```

```
cube.getMaps()
modelcube.getMaps()
modelcube.getCube()
Get a Maps or Cube.
```

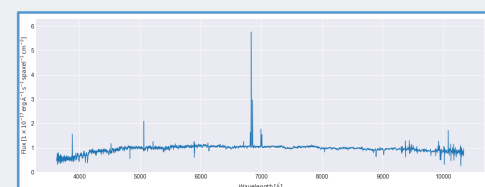
Spaxel

```
maps[1, 2]
Get spaxel (y=1, x=2). Also works for Cube and ModelCube.
```

```
sp = maps.getSpaxel(y=1, x=2, xyorig='lower', model=True)
Get spaxel (y=1, x=2) with model fits.
```

```
sp.flux.value
sp.flux.ivar
Spectrum flux and inverse variance arrays.
```

```
sp.full_fit.value
Get model fits.
```



sp.flux.plot()

Masks

```
ha.pixmask.schema
ha.pixmask.get_mask('NOCOV')
ha.pixmask.values_to_labels()[1][2]
Flags for spaxel (y=1, x=2).
```

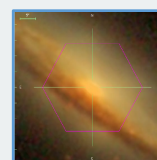
```
ha.target_flags
Show targeting masks.
```

Cube and ModelCube also have `pixmask` and `target_flags`.

Images

```
from marvin.utils.general import images
images.getImagesByList(['8485-1901', '7443-12701'])
Download list of images.
```

```
images.showImage(plateifu='8553-12702')
Show an image.
```



Query & Results

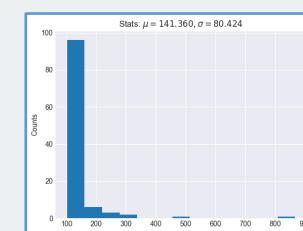
```
from marvin.tools.query import Query
sf = 'nsa.z < 0.1 and stellar_vel > 100'
rp = ['stellar_sigma']
q = Query(searchfilter=sf, returnparams=rp)
r = q.run()
Build and run query.
```

```
r.extendSet()
r.loop()
r.getAll()
Extend results set.
```

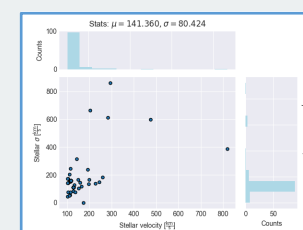
```
r.getNext()
r.getPrevious()
Cycle through results.
```

```
r.download()
Download query results.
```

```
r.toTable()
r.toDF()
r.convertToTool()
Convert to astropy Table, pandas DataFrame, or Marvin objects.
```



r.hist('stellar_vel')



r.plot('stellar_vel', 'stellar_sigma')