

ObjectExtraction

October 29, 2016

1 Object extraction methods

We compare here the results from three object extraction methods. In this notebook we only investigate the positions of the objects detected in one CCD.

The methods are:

1. imcore
2. sextractor
3. Python based method

```
In [1]: from scipy.spatial import KDTree
import numpy as np
from astropy.io import fits
from astropy.table import Table
import extractor

import matplotlib.pyplot as plt
%matplotlib inline
```

1.1 Read data

The imcore and sextractor catalogues have been generated in advance. We generate here the Python catalogue.

```
In [2]: # Imcore catalogue
cat = fits.open('simone_ccd_2_cat.fits')
imcore = Table(cat[1].data)

# SExtractor catalogue
cats = fits.open('simone_ccd_2_sex.fits')
sext = Table(cats[2].data)

# Python catalogue
fh = fits.open('simone_ccd_2.fits')
img = fh[1].data
this = extractor.extract(img)
```

1.2 Offsets

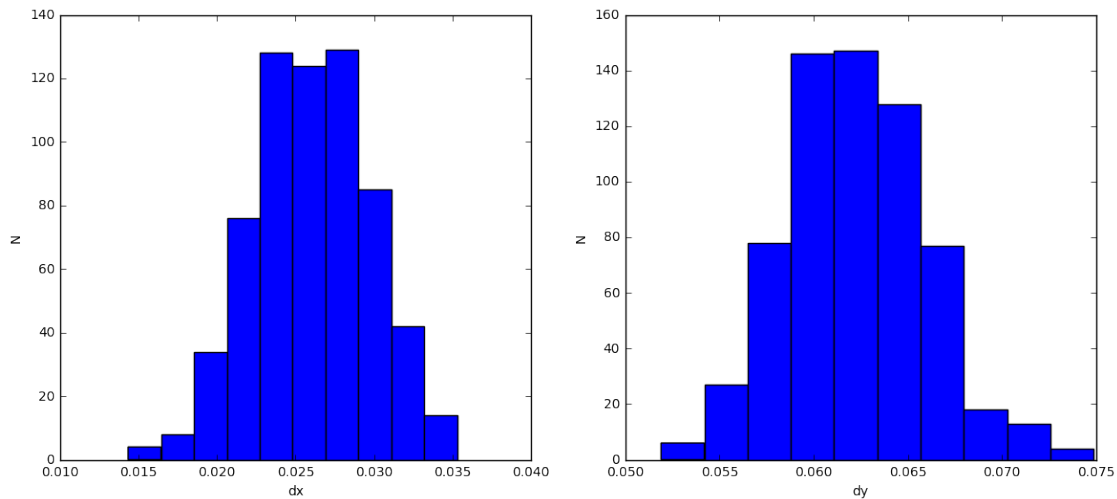
For each comparison two histograms are given: the difference in pixels between the x and y positions for common detected sources.

```
In [3]: def compute_offset(x1, y1, x2, y2):
        inc = np.array([x1, y1]).transpose()
        outc = np.array([x2, y2]).transpose()
        c = KDTree(inc)
        dist, idx = c.query(outc, 1)
        fig = plt.figure(figsize=(14,6))
        plt.subplot(1,2,1)
        plt.hist((inc[:,0][idx] - outc[:, 0]))
        plt.xlabel('dx')
        plt.ylabel('N')

        plt.subplot(1,2,2)
        plt.hist((inc[:,1][idx] - outc[:, 1]))
        plt.xlabel('dy')
        plt.ylabel('N')
```

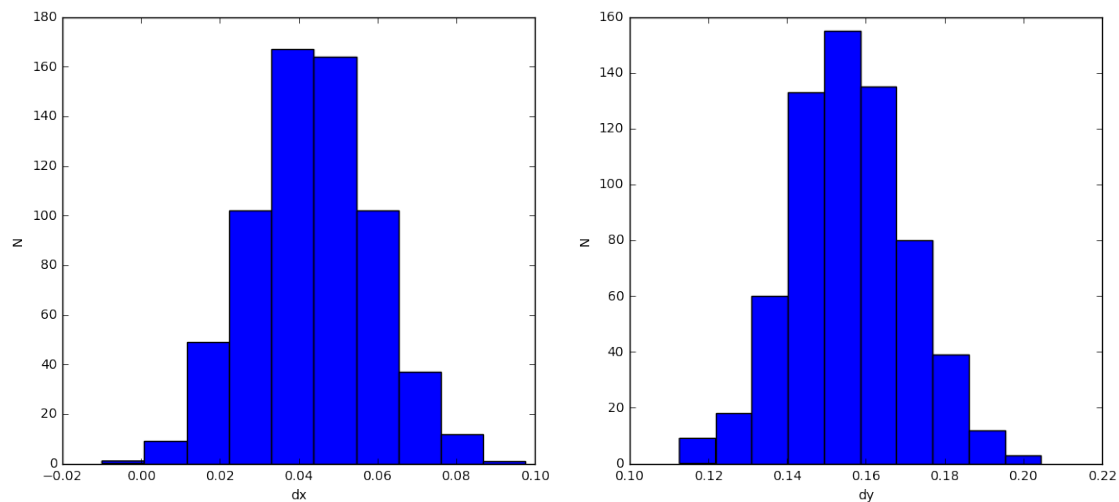
1.2.1 Offsets between Python method and imcore

```
In [4]: compute_offset(this['x'], this['y'], imcore['X_coordinate'], imcore['Y_coord
```



1.2.2 Offsets between Python method and sextractor

```
In [5]: compute_offset(this['x'], this['y'], sext['X_IMAGE'], sext['Y_IMAGE'])
```



1.2.3 Offsets between imcore and sexttractor

In [6]: `compute_offset(imcore['X_coordinate'], imcore['Y_coordinate'], sext['X_IMA`

