# Coding Sprint Project: Morphological Deconvolution

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Ctools Coding Sprint
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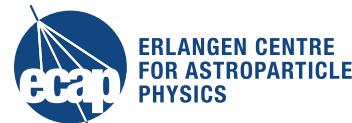
What is Deconvolution?

Source image

True source morphology

PSF

$$I(x,y) = A(x,y) \, (O \otimes PSF)(x,y) + A(x,y)B(x,y)$$

Acceptance
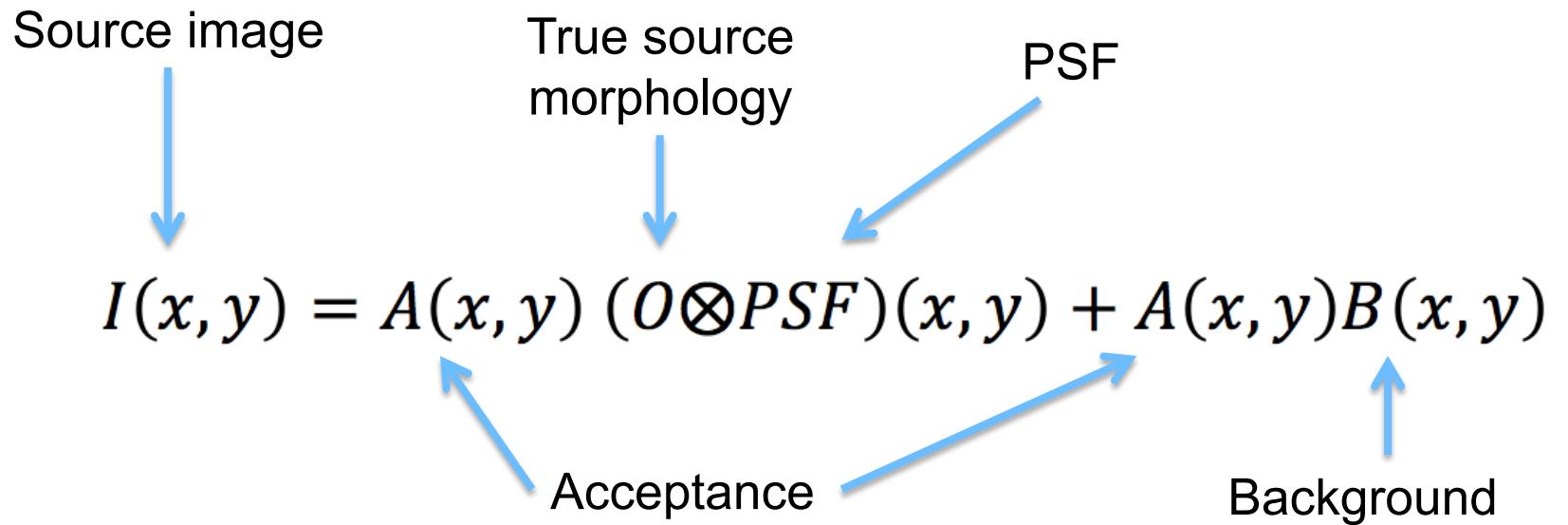
Background

What is Deconvolution?

Step 1: Correction for background and acceptance
(ctools analysis)

Source image

True source morphology

PSF

$$I(x, y) = A(x, y)\,(O \otimes PSF)(x, y) + A(x, y)B(x, y)$$
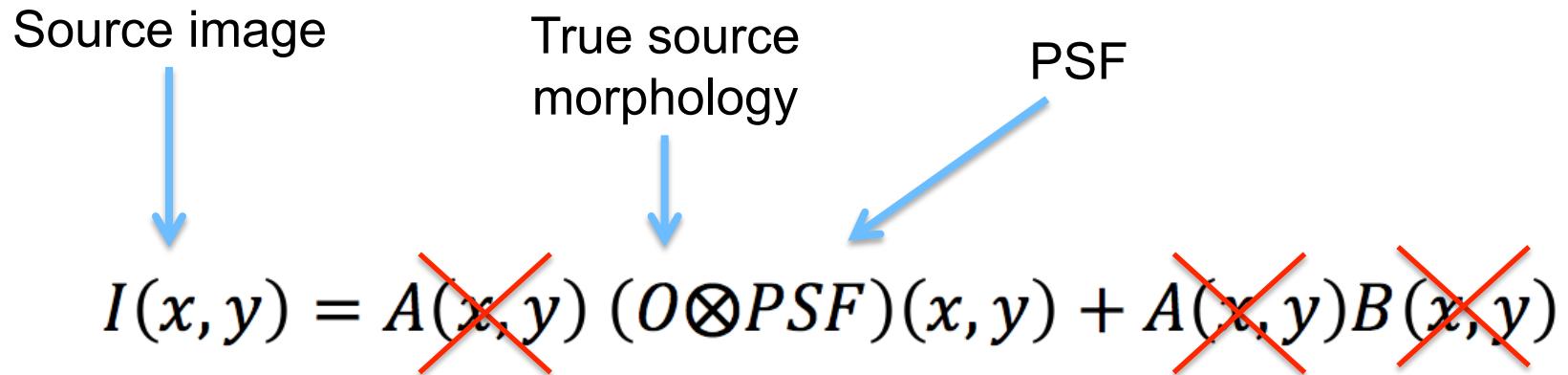
What is Deconvolution?

Excess map

True source morphology

PSF

$$E(x, y) = (O \otimes PSF)(x, y)$$

What is Deconvolution?

Step 2: Reverse undesired convolution with PSF (deconvolution)

True source
morphology

$$E(x,y) = (O \otimes PSF)(x,y)$$

What is Deconvolution?
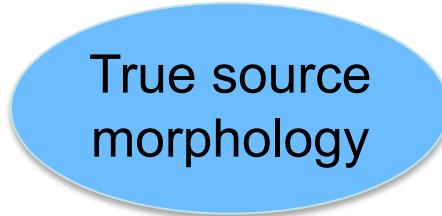
True source morphology

I am working on a study of how well adjacent point sources can be separated with 'maximum entropy deconvolution'

What is needed?

$$E(x, y) = (O \otimes PSF)(x, y)$$

Maximum entropy algorithm in separate program (✓)

needs normalized fits images of PSF and excess map

→ **Mean 2D PSF**   I already prepared python code

→ **Change fits format**   Only GFitsImageDouble implemented,

                                      I need GFitsImageFloat!

(→ Implement maximum entropy algorithm in ctools?)

Any help is welcome =)