# Delsimi: A Simulation Code for Delphini-1

Software and Satellite Operations

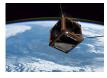
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## Delsimi: Justification

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Hubble Space Telescope, NASA



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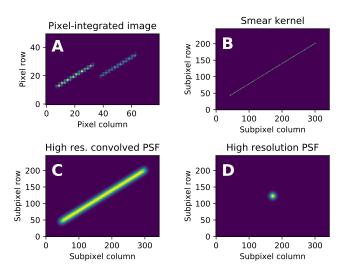


Gomspace, Wiegaarden, ESA

Hubble Space Telescope, NASA

## photometry performance

### Star Simulation



### Star Trail Method

Convolution Evaluation

Pros: Pros:

High accuracy Fast computing time

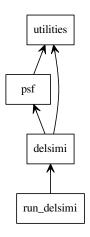
Custom PSF Custom PSF

Cons: Variable PSF

Long computing time Cons:

No variable PSF Not as accurate

### Delsimi Code Structure



#### delsimi.delsimi

angle sat: float

angle\_vel: float
ccd\_shape: recarray, list
ccd\_shape: recarray, list
gain: int
input\_dir: str
integration\_time: float
maxVmag: float
output\_dir: str
overwrite: bool
pixel\_scale: float
spat\_res: float
make\_catalog()

#### psf.PSF

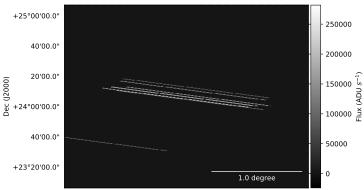
X
Y
buffer: int
col\_changes: tuple
fwhm: int
imshape: recarray
integration\_time
kernelShape
row\_changes: tuple
superres: int
convolvePSF()
evaluate()
highresPSF()

highresPSF() integrate\_to\_image() integratedGaussian() makeFocusKernel() makeJitterKernel() makeSmearKernel() make PRF()

(created with: pyreverse -my -A -o pdf -p <name> \*\*.py)

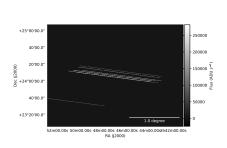
## Output: FITS Image

V < 5, t = 100 s



52m00.00s 50m00.00s 48m00.00s 46m00.00s 44m00.00s3h42m00.00s RA (J2000)

## Output: FITS Image

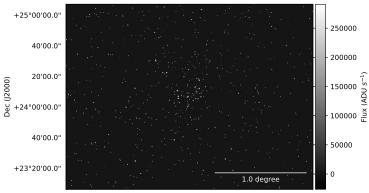




(Aladin sky atlas)

## Output: FITS Image

V < 10, t = 0.1s



### Future Extensions

## Added since protocol:

performance: Evaluation to replace convolution

application: Catalog stars (astroquery)

### Still needed:

accuracy: Realistic magnitude to flux conversion

accuracy: More realistic noise

structure: Color and position variable PSF

### Source Code and Protocol

https://github.com/jonasshansen/delsimi