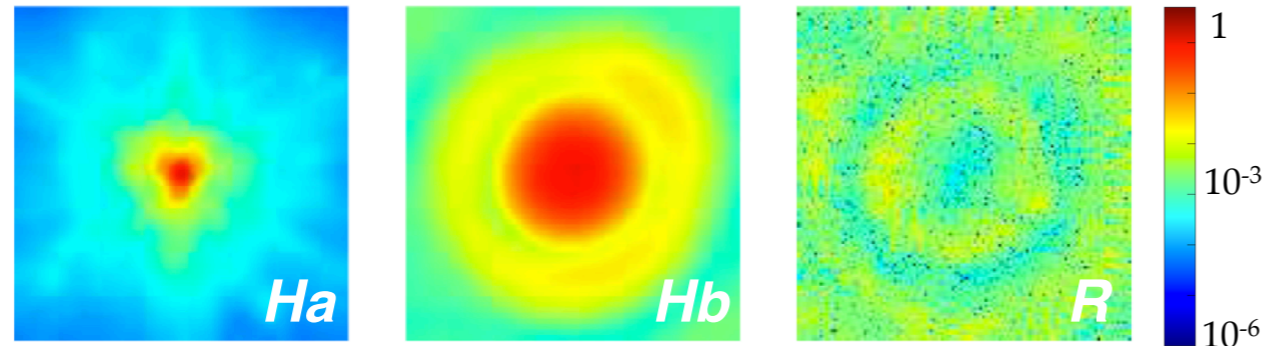
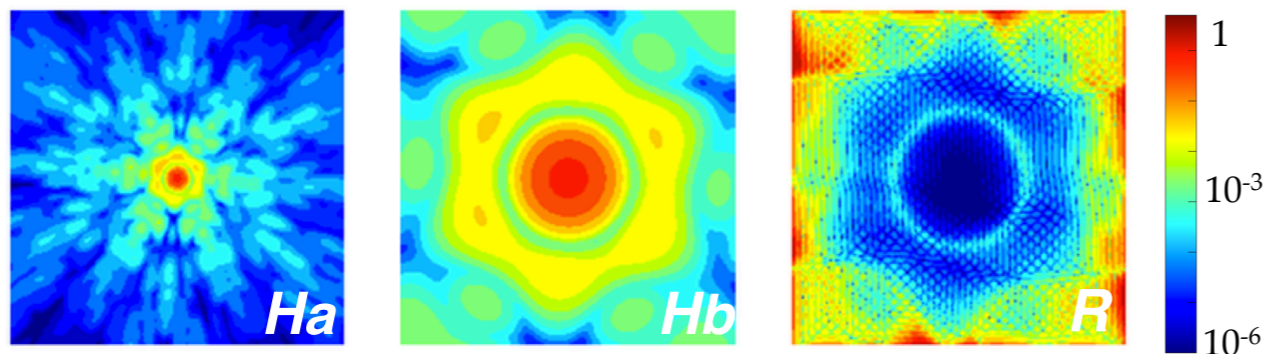


Convolution kernels for multi-wavelength imaging



Herschel/PACS 70 μm Herschel/SPIRE 250 μm Relative residuals



JWST/MIRI 5.6 μm JWST/MIRI 25.5 μm Relative residuals

$$\text{residuals } R = \frac{|k * H_a - H_b|}{H_b}$$

simulations : $R < 10^{-4} - 10^{-5}$

data : $R < 10^{-2} - 10^{-3}$

arXiv:1609.02006

- necessary for precise aperture photometry
- new method captures the complex shape of both PSFs
- developed for Euclid and validated with Herschel data
- use Fourier filtering (fast) and regularisation (robust to noise)

PyPHER : PSF Homogenization kERnels



Installation

```
pip install pypher
```

Usage

```
pypher psf_in.fits psf_out.fits kernel.fits
```

input centered PSFs
output kernel

- Uses the **actual shape** of the PSFs (no parametrisation)
- **Low residuals** and border effects
- Online documentation: pypher.rtdfd.io
- Open source: git.io/vXj0O
- Code can be **cited** (see <https://doi.org/10.5281/zenodo.61392>)

Adopted by DustPedia
and used in recent
ASTRODEEP papers