# Applications for advanced characterisation metadata

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*on behalf of the characterisation/observation subgroup of the IVOA DM WG*

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# What is advanced metadata?

- «Level 4» characterisation, providing transmission function for a voxel in the multidimensional parameter space

# Characterisation DM

Provides a physical characterisation of a dataset

| *Level 1* | Coverage | Resolution | Sampling |
|---|---|---|---|
| Spatial (pos) | Location | Ref.Value | Ref.Value |
| Temporal (time) | Location | Ref.Value | Ref.Value |
| Spectral (em) | Location | Ref.Value | Ref.Value |
| Observable (phot) | Location | Ref.Value | Ref.Value |

# Characterisation DM

Provides a physical characterisation of a dataset

| *Level 1* | Coverage | Resolution | Sampling |
|---|---|---|---|

| *Level 2* | Coverage | Resolution | Sampling |
|---|---|---|---|
| Spatial (pos) | Bounds | Bounds | Bounds |
| Temporal (time) | Bounds | Bounds | Bounds |
| Spectral (em) | Bounds | Bounds | Bounds |
| Observable (phot) | Bounds | Bounds | Bounds |

# Characterisation DM

Provides a physical characterisation of a dataset

| *Level 1* | Coverage | Resolution | Sampling |
|---|---|---|---|

| *Level 2* | Coverage | Resolution | Sampling |
|---|---|---|---|

| *Level 3* | Coverage | Resolution | Sampling |
|---|---|---|---|
| Spatial (pos) | Support | Support | Support |
| Temporal (time) | Support | Support | Support |
| Spectral (em) | Support | Support | Support |
| Observable (phot) | Support | Support | Support |

# Characterisation DM

Provides a physical characterisation of a dataset

| *Level 1* | Coverage | Resolution | Sampling |
|---|---|---|---|

| *Level 2* | Coverage | Resolution | Sampling |
|---|---|---|---|

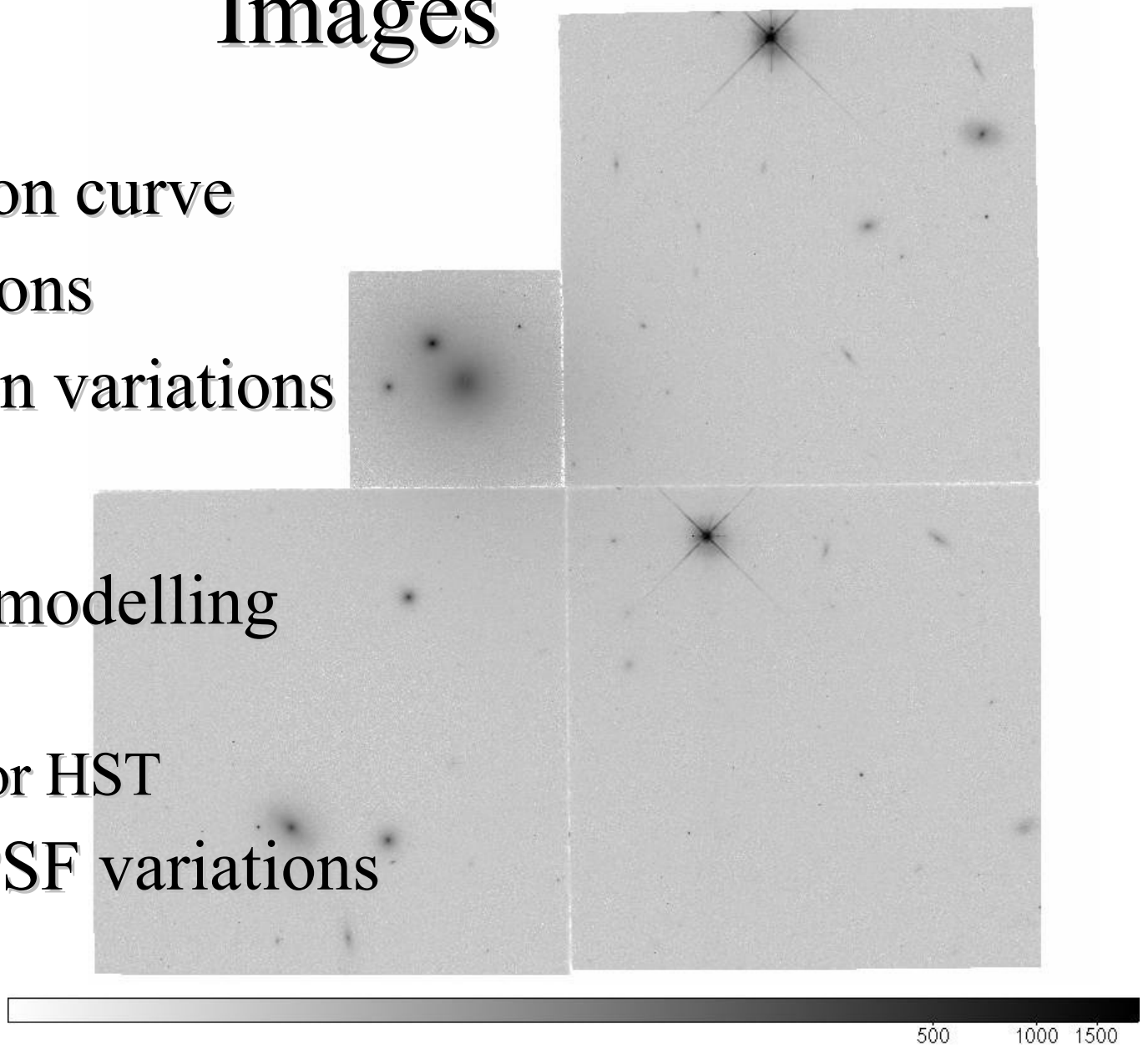
| *Level 3* | Coverage | Resolution | Sampling |
|---|---|---|---|

| *Level 4* | Coverage | Resolution | Sampling |
|---|---|---|---|
| Spatial (pos) | Map | Map | Map |
| Temporal (time) | Map | Map | Map |
| Spectral (em) | Map | Map | Map |
| Observable (phot) | Map | Map | Map |

# Images

- Transmission curve
- PSF variations
- transmission variations

- Instrument modelling
  - Manuals
  - TinyTim for HST
- Empirical PSF variations



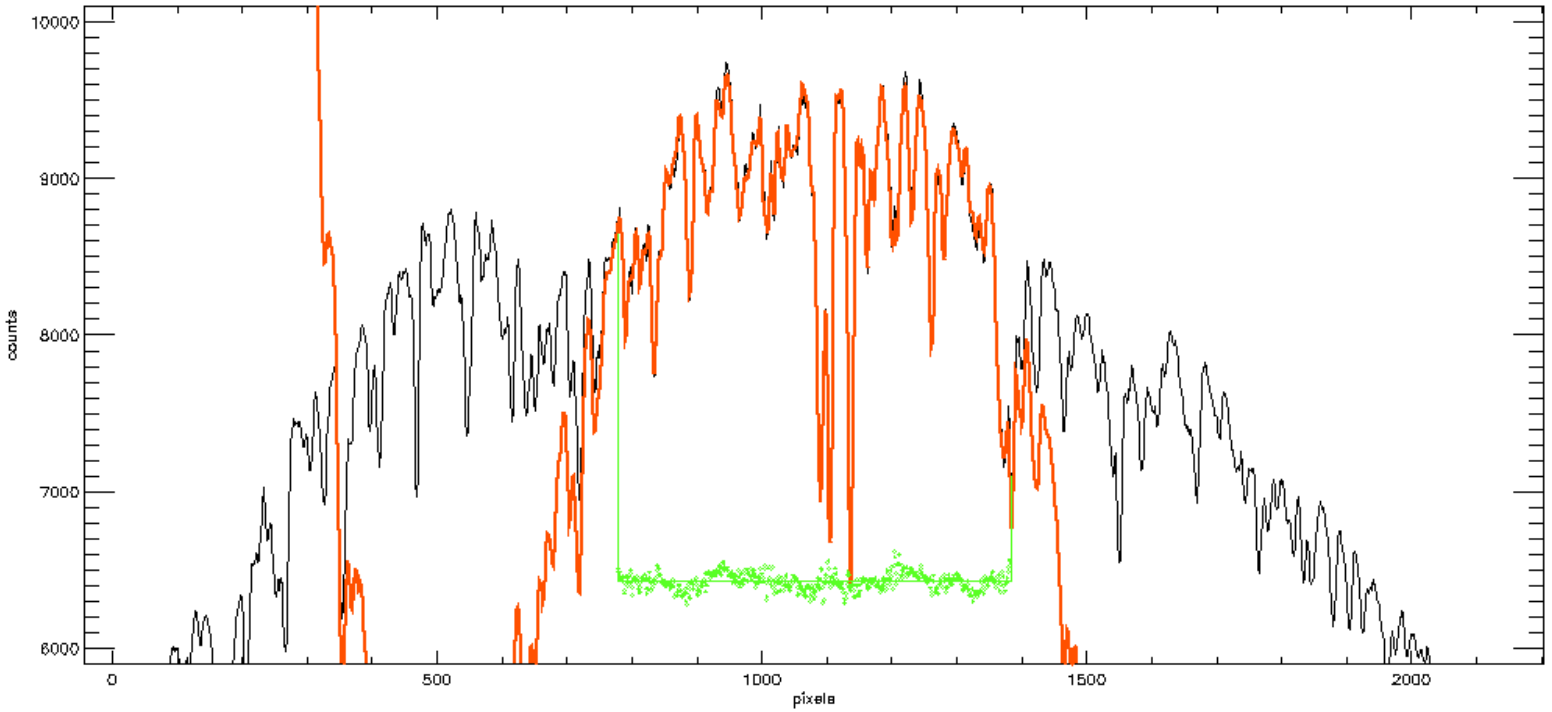
# Images

Why is it important?

- It is strongly desirable to know which photometric band you're working in :)
- PSF variations may lead to spurious photometric measurements (or details in colour maps) especially in case of undersampled PSF (e.g. WFPC2)
- transmission variations: systematic photometric errors

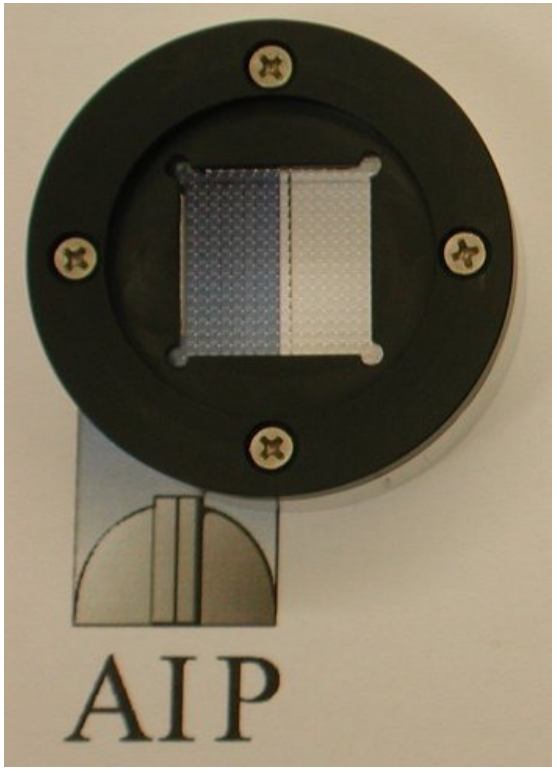
# Spectra

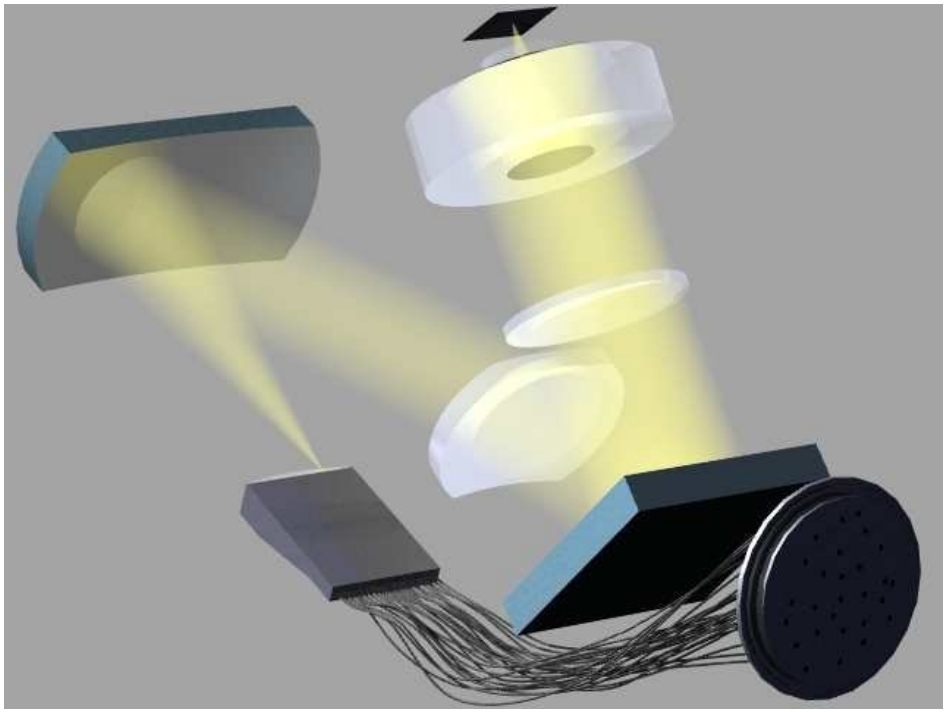
- Variations of spectral resolution along the wavelength
  - Instrument modelling
  - fitting «standard» spectra or measuring arc lines



# Complex Spectra

- Variations of spectral resolution across the field of view AND wavelength range



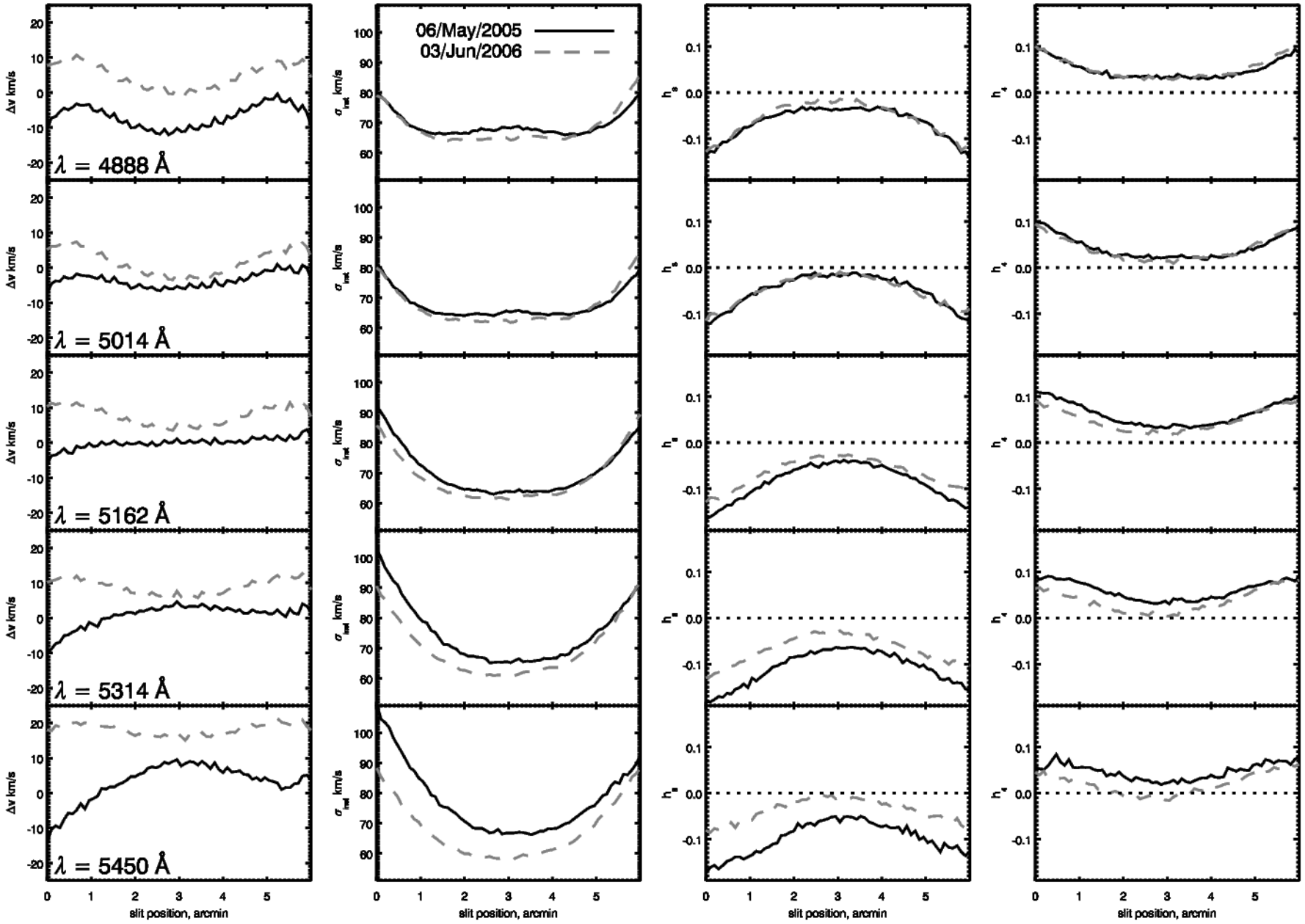



# (Complex) Spectra

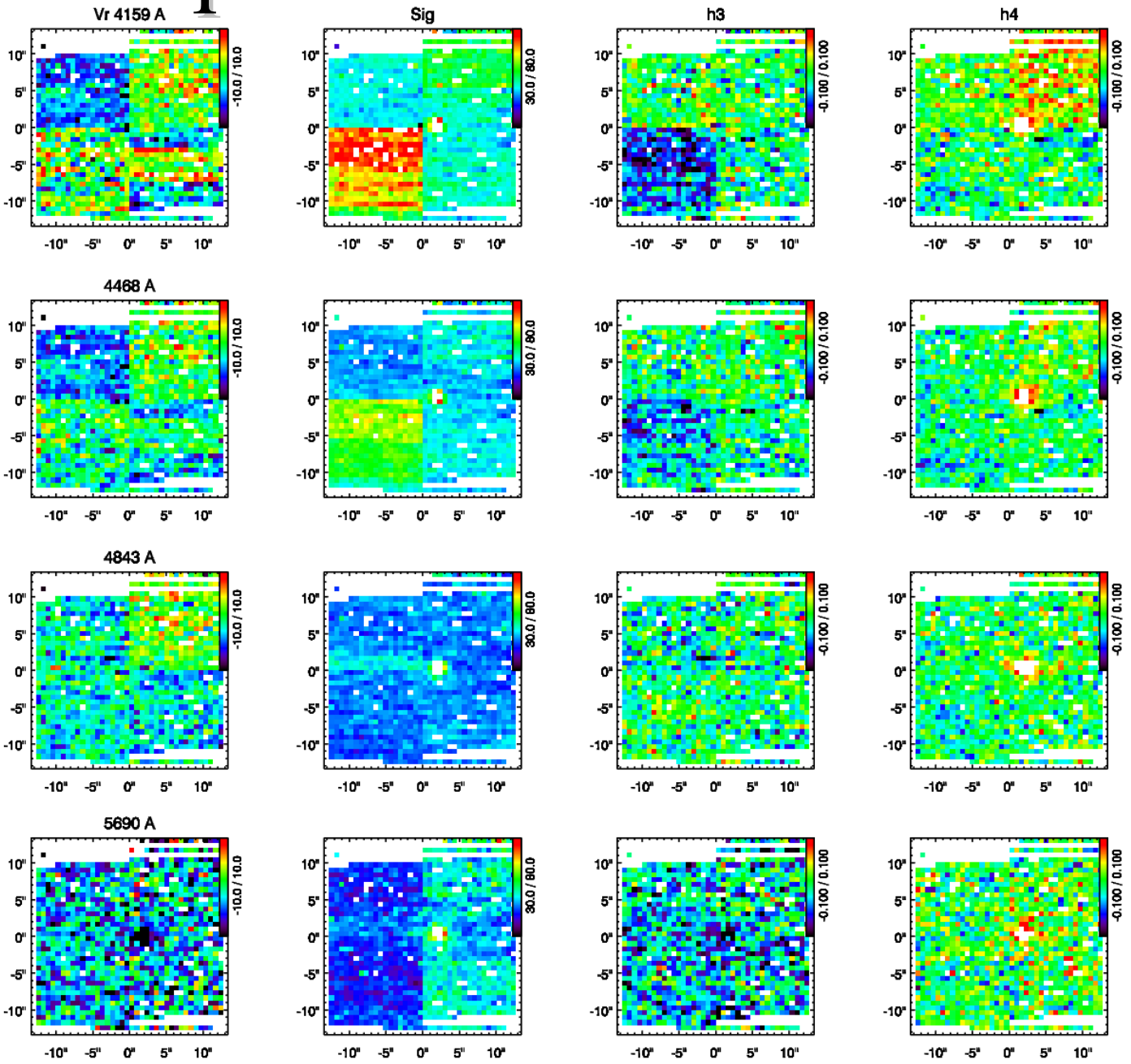
Why is it important?

- LSF variations may lead to spurious features in measuring line strengths / kinematics
- These LSF variations are [often] VERY SIGNIFICANT and presently not taken into account in most of the cases

# Example 1: long-slit



# Example 2: VIMOS IFU



# Storing and Accessing

- Non-parametric description
- Parametric description
  - Gauss-Hermite representation of LSF/PSF
  - Variations across the FoV / wavelength range to be presented using polynomial parametrisation
- Access
  - URL to the files containing these extra bulky metadata
  - ???