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Capivara:

A spectro-based segmentation method

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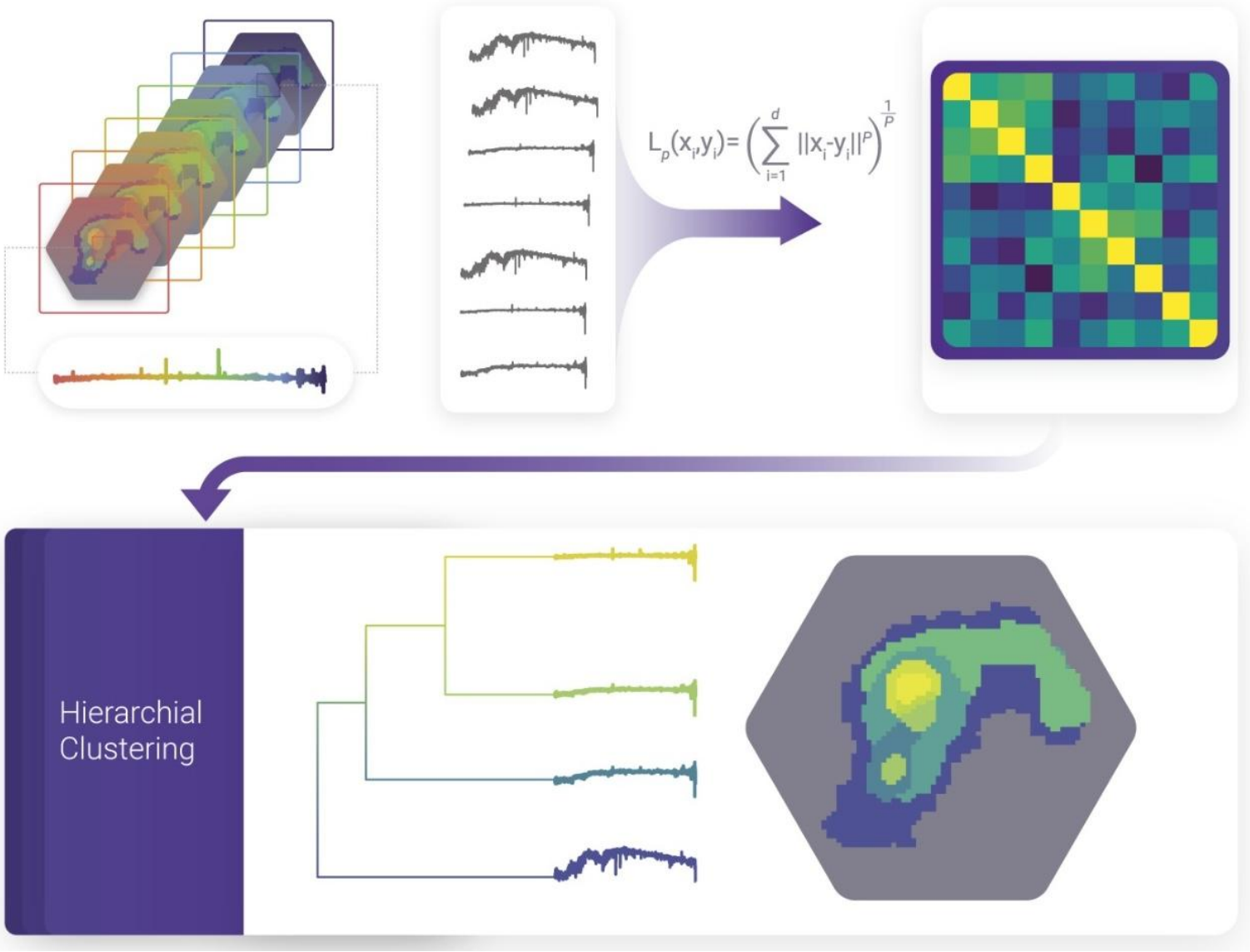
1. workflow

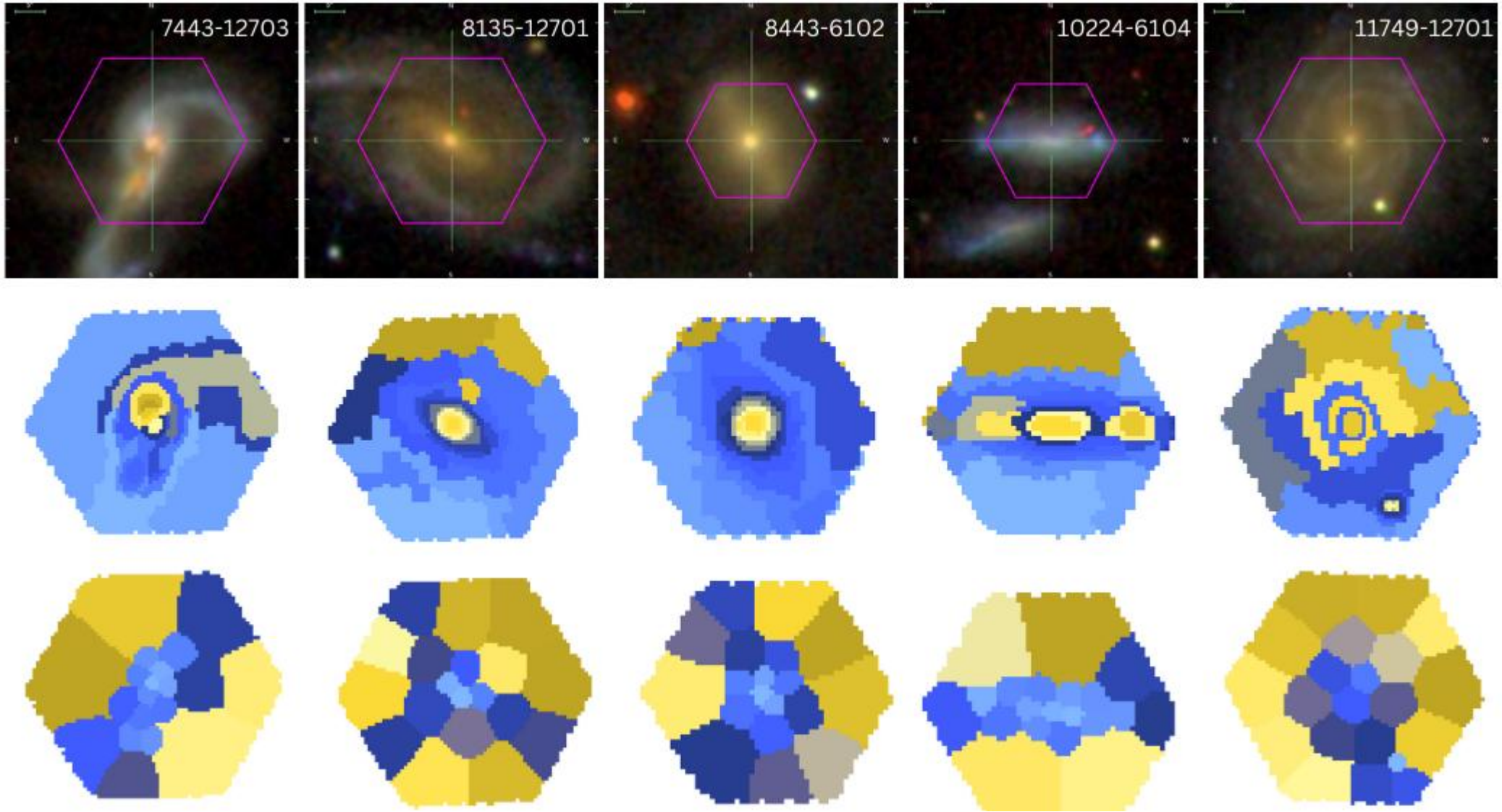


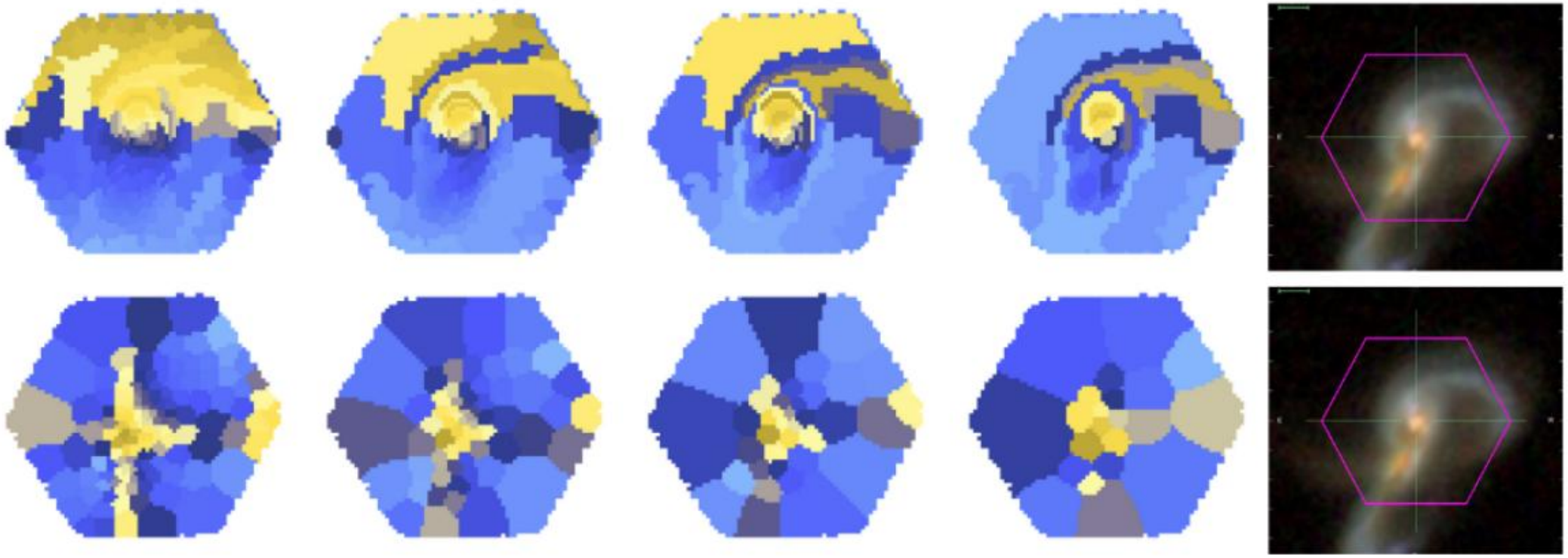
- The model reads an IFU data cube composed of multiple wavelength channels.

- Hierarchical clustering is then performed on the dissimilarity matrix computed from pairwise distances between all spectra within the cube.

- Once the groups are assigned, the data is back-transformed into a 2D matrix where each group represents spectra with similar features

2. comparison with Voronoi (Vorbin)

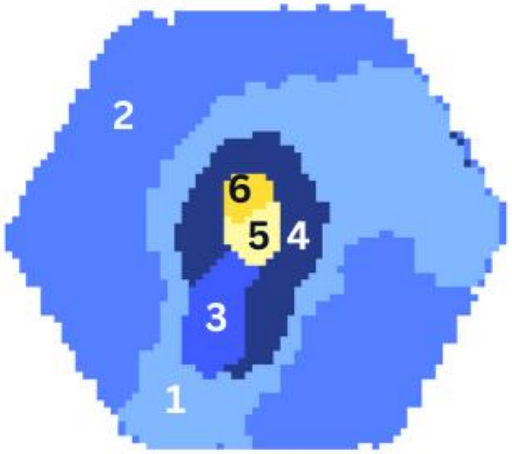


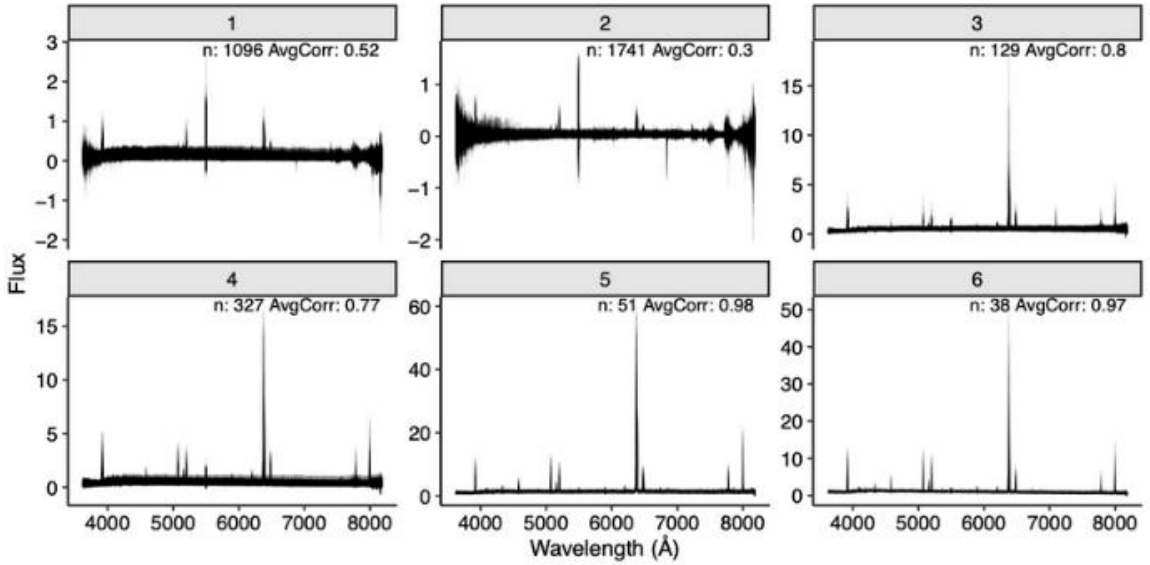


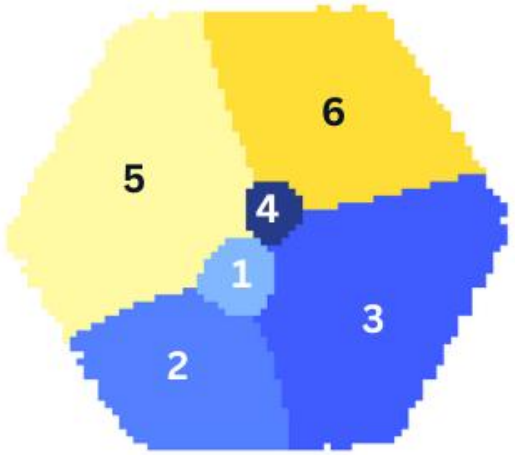
Vorbin: target S/N to 50, 100, 150, 200, 250.
Capivara: set comaprable group numbers.

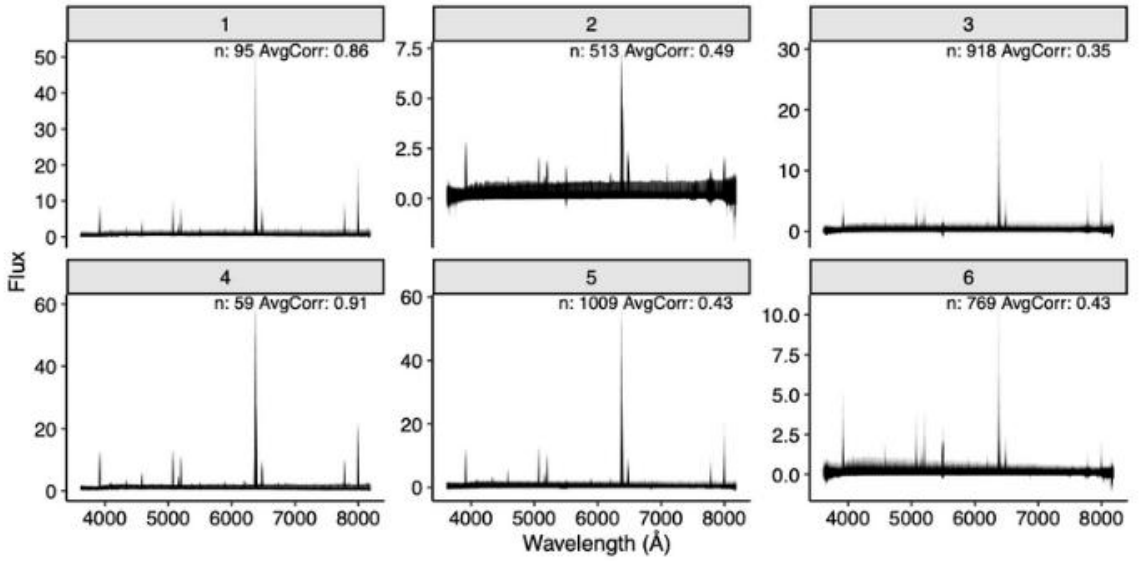
Capivara shows visual resemblance to the composite SDSS image!

Capivara: be able to preserve shape & physical information throughout the data when clustering

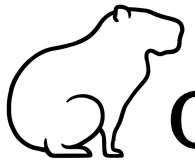








3. conclusion



Capivara is a R/Python package designed specifically to enhance the study of structural properties in galaxies.

Methods: Capivara employs hierarchical clustering in the spectral domain to group similar spectra.

Aims:

① IFU segmentation;
② improve S/N but remain physical structures (compare to Voronoi).