

# White Dwarfs in the HETDEX survey

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**HETDEX**  
Hobby-Eberly Telescope Dark Energy Experiment

Illuminating the Darkness

# Dark energy:

Accelerated expansion



Energy with large negative

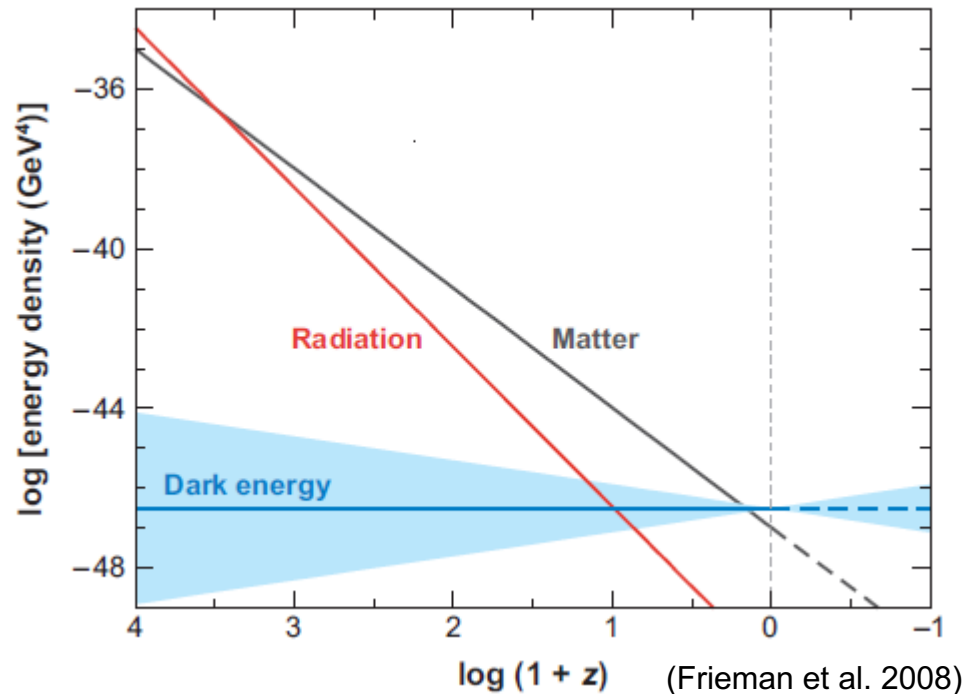
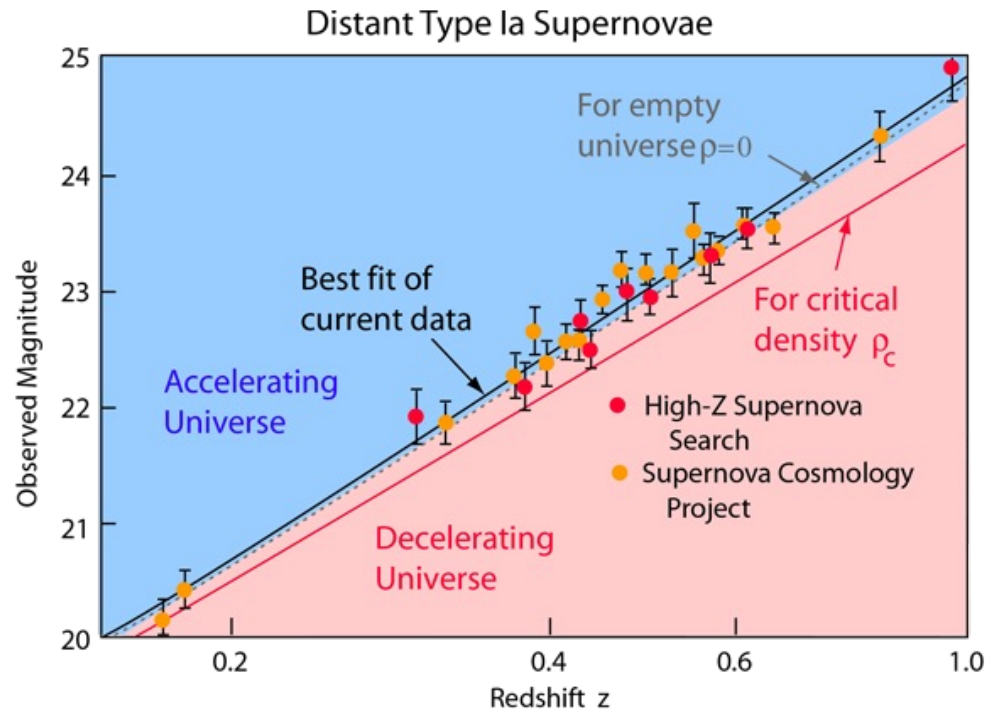
pressure



75% of the universe



$z \sim 0.4$  and  $t \sim 10 \text{ Gyr}$



# Hobby-Eberly Telescope (HET)

An aerial photograph of the Hobby-Eberly Telescope (HET) at McDonald Observatory. The telescope is a large, white, dome-shaped structure with a hexagonal grid pattern on its upper half. It is situated on a hillside with sparse vegetation. To the left of the dome is a tall, white, cylindrical structure. The surrounding area includes a paved road, some smaller buildings, and a fence line. The background shows a hilly landscape with trees and a clear sky.

Location: McDonald Observatory ( $30^{\circ} 40' N$ )

Low cost: 15-20% of the cost of a 9 m telescope

Primary mirror: 11.1 x 9.8 m (9.2 m effective aperture)

91 hexagonal mirrors

Fixed elevation angle of  $55^{\circ}$  (tilted Arecibo design)

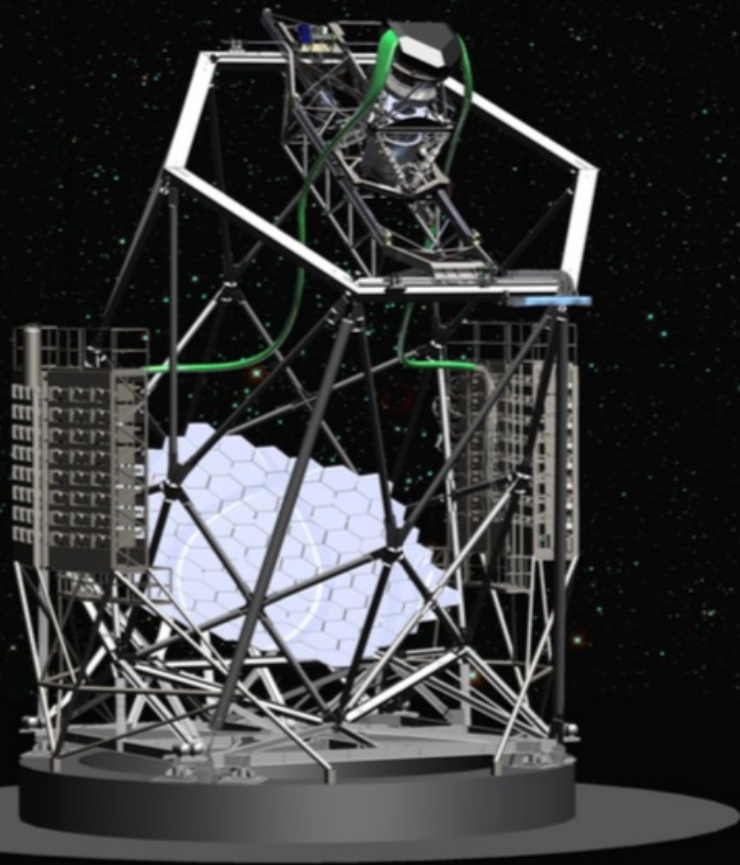
Access 81% of the sky

Queue schedule

Instruments: HRS, LRS, MRS

Model for SALT

# HETDEX: HET Dark Energy Experiment



Goal: *probe dark energy*

~1400 hours in dark time for 7 years

Targets: Lyman- $\alpha$  emitting galaxies

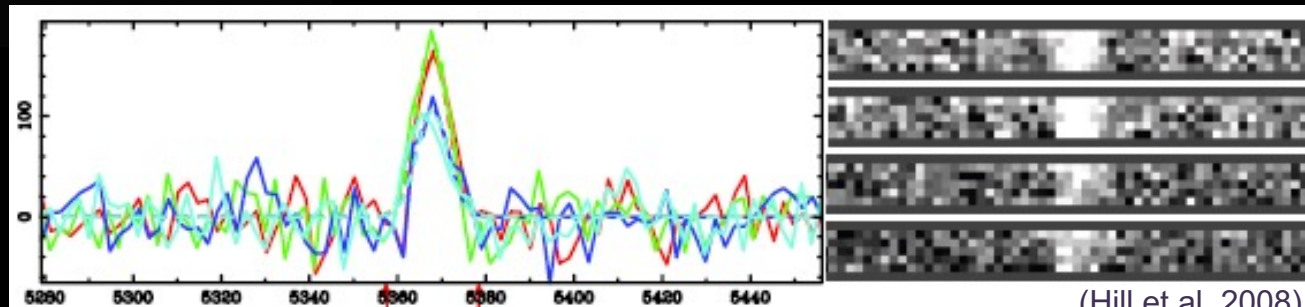
156 VIRUS (3500 - 5500Å)

~3400 spectra

Resolution ~ 2Å

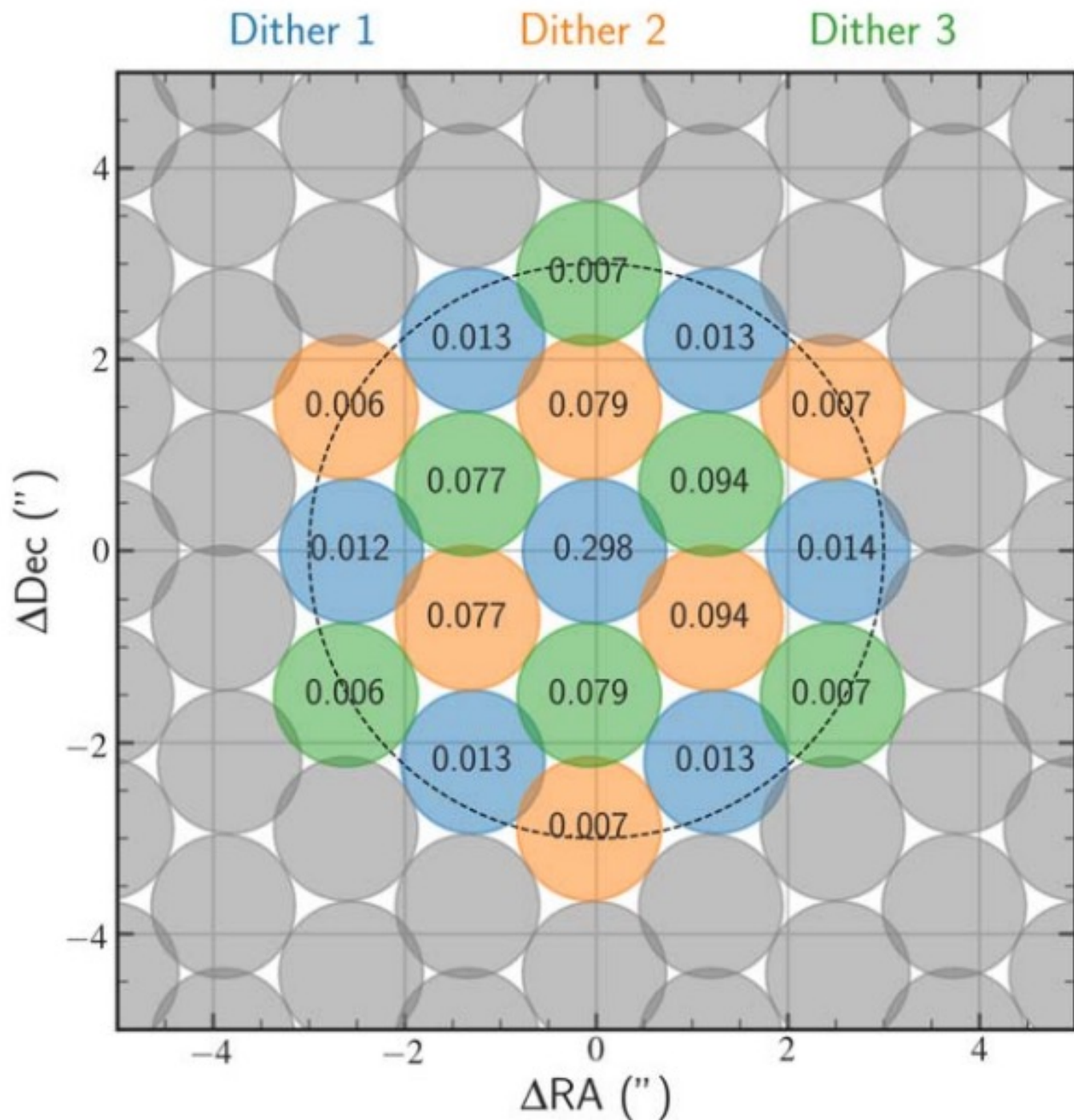
Exposure time: 18min

Dark time

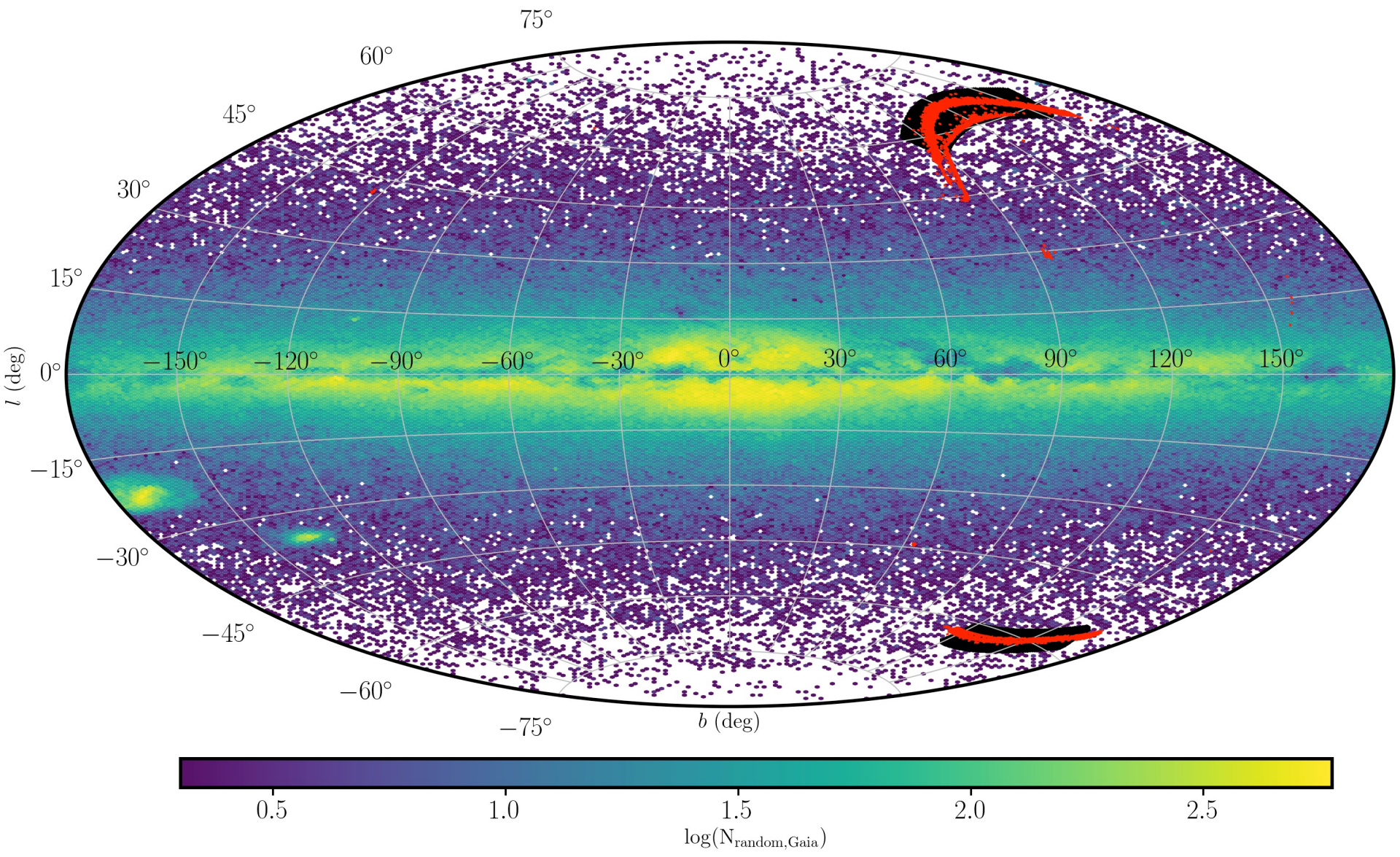


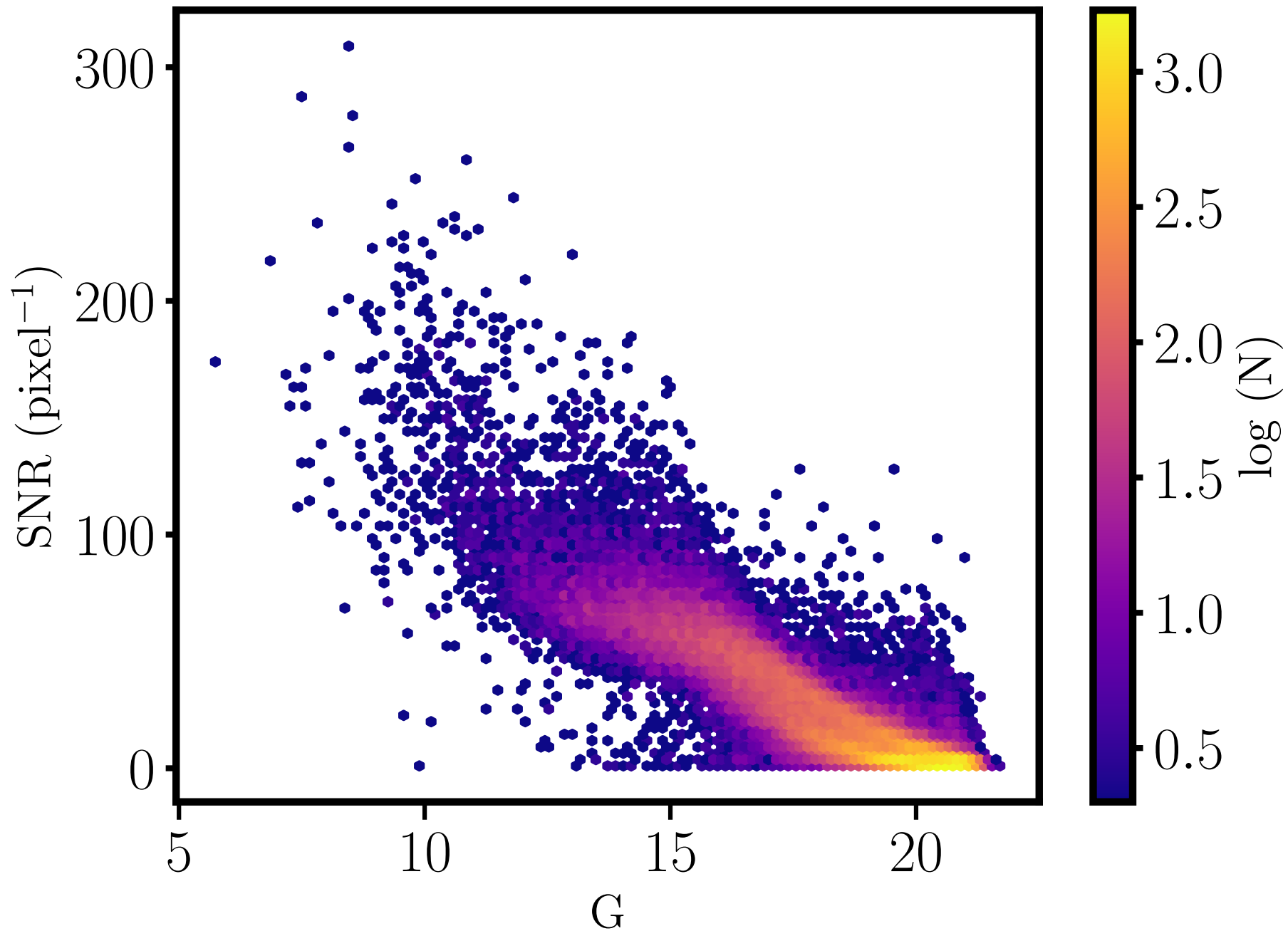
(Hill et al. 2008)





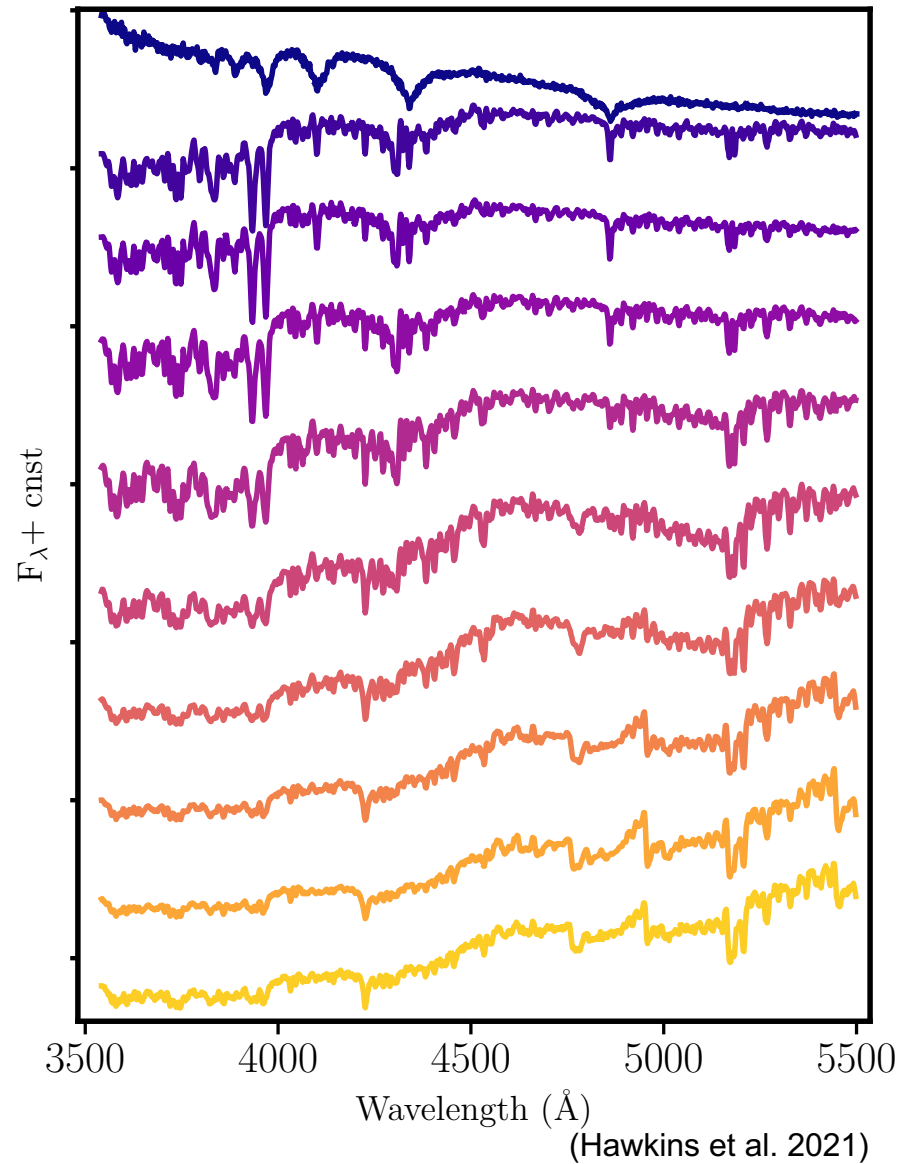
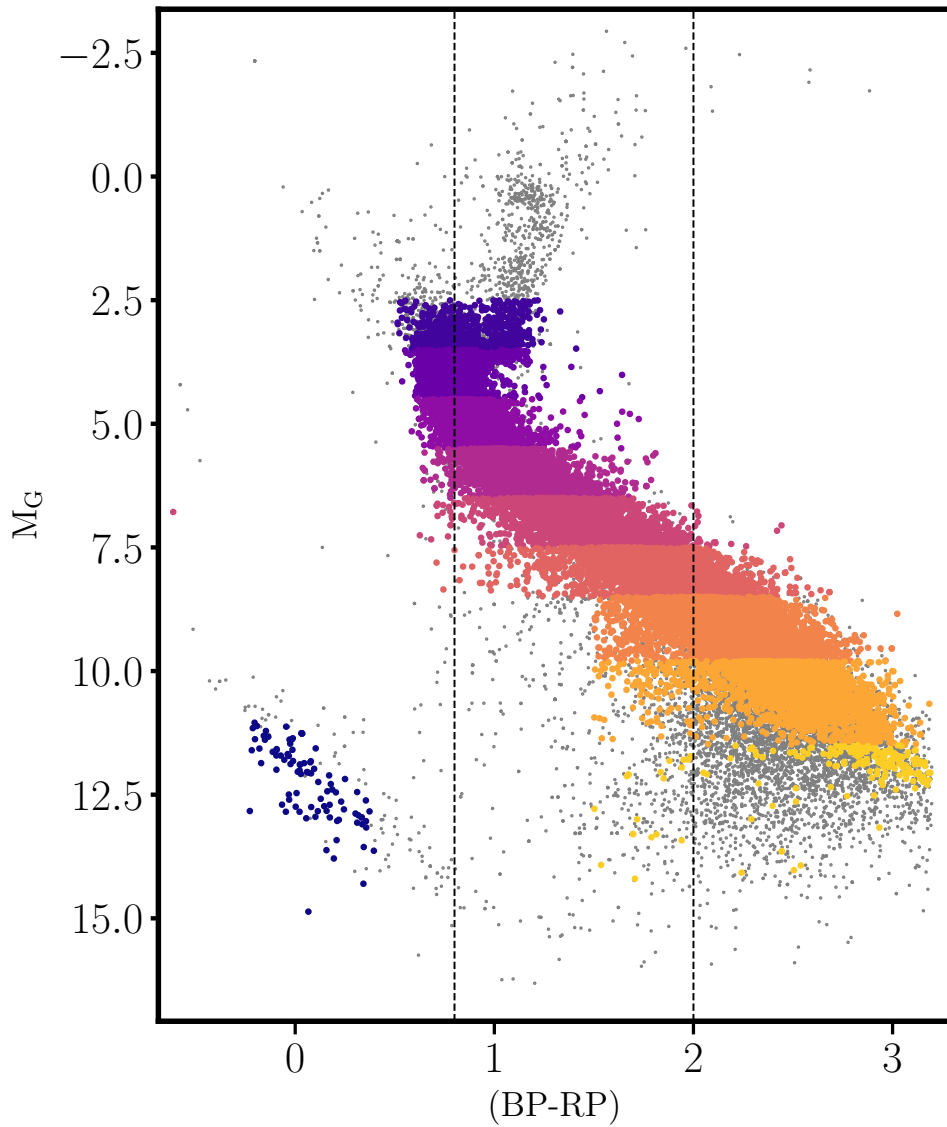
• HETDEX-Gaia      ◦ HETDEX fields



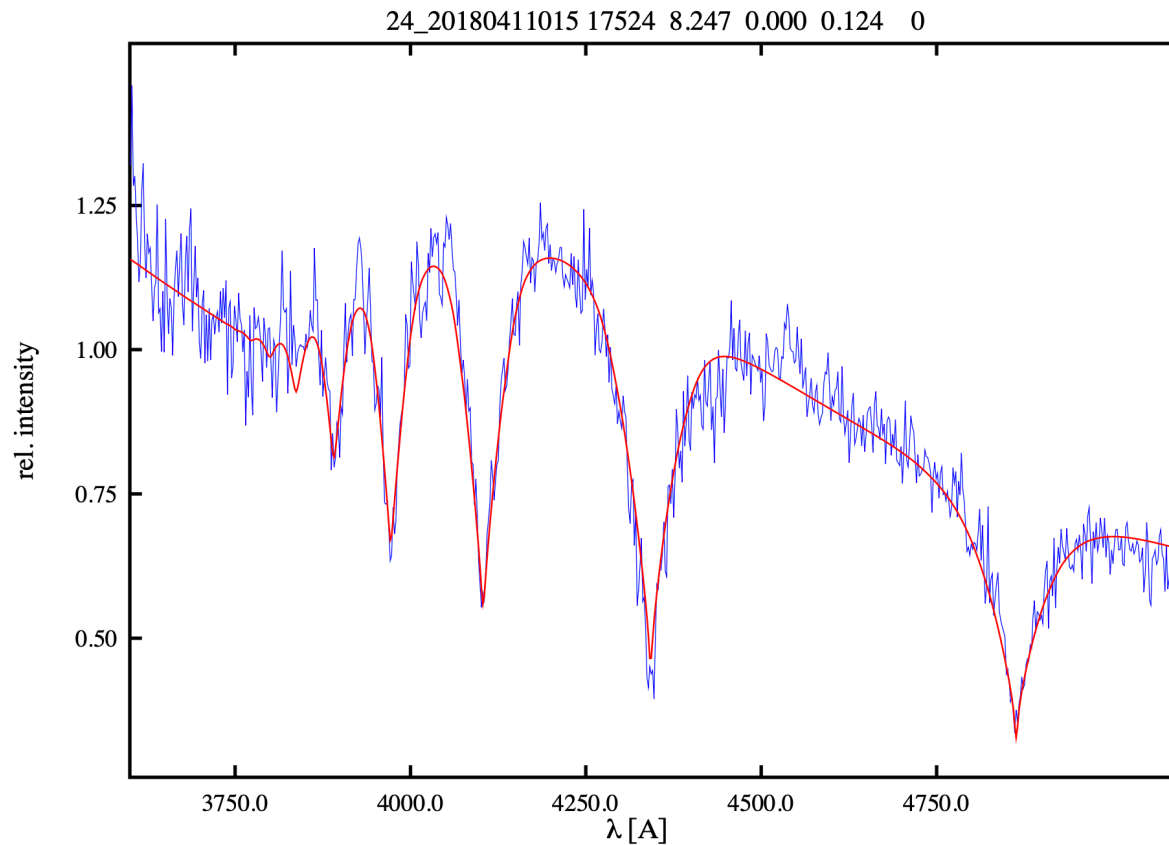




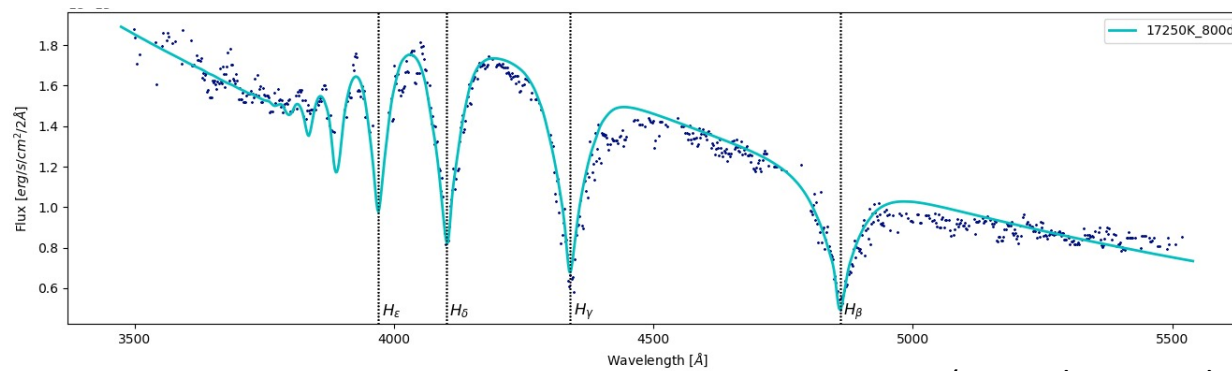
# Stars in HDR2



# Spectroscopic fitting HDR2

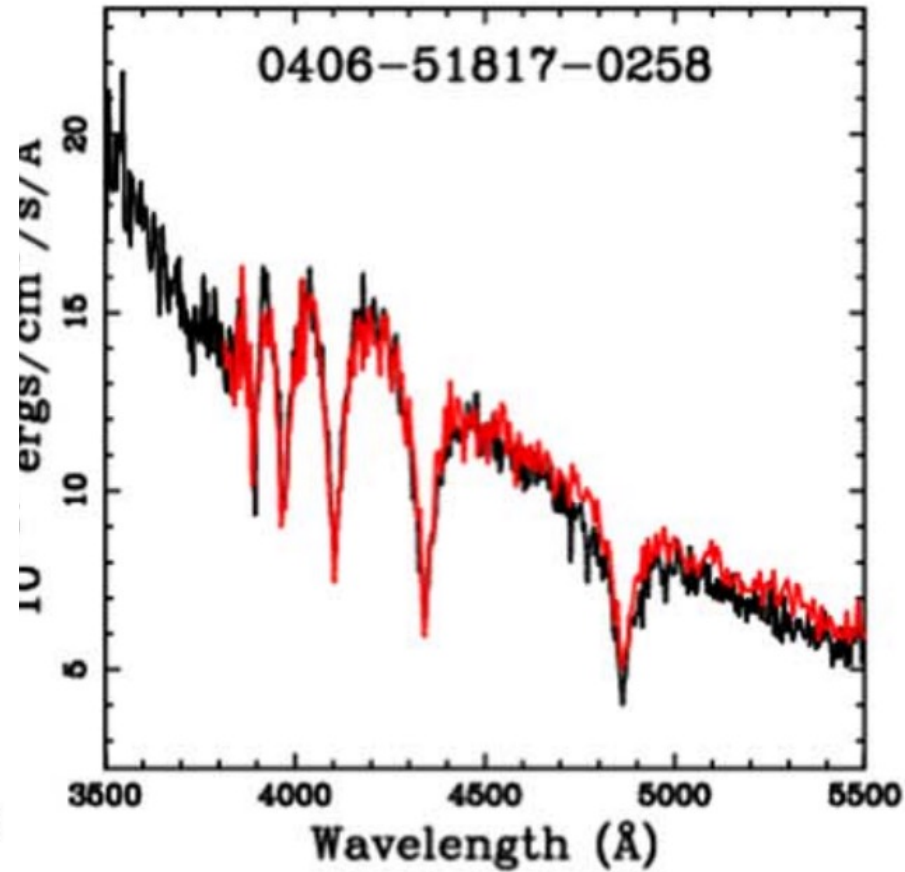
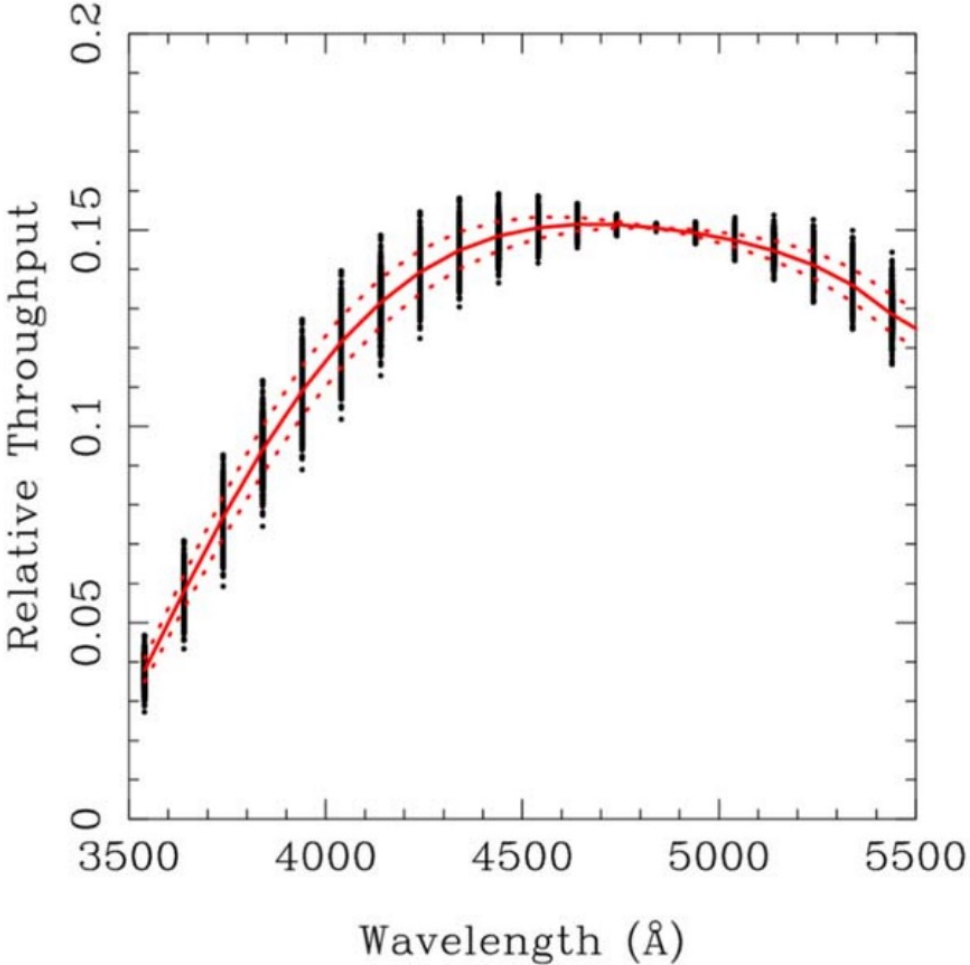


$G_{\text{gaia}} = 19.8$   
 $d = 407 \pm 61$  pc



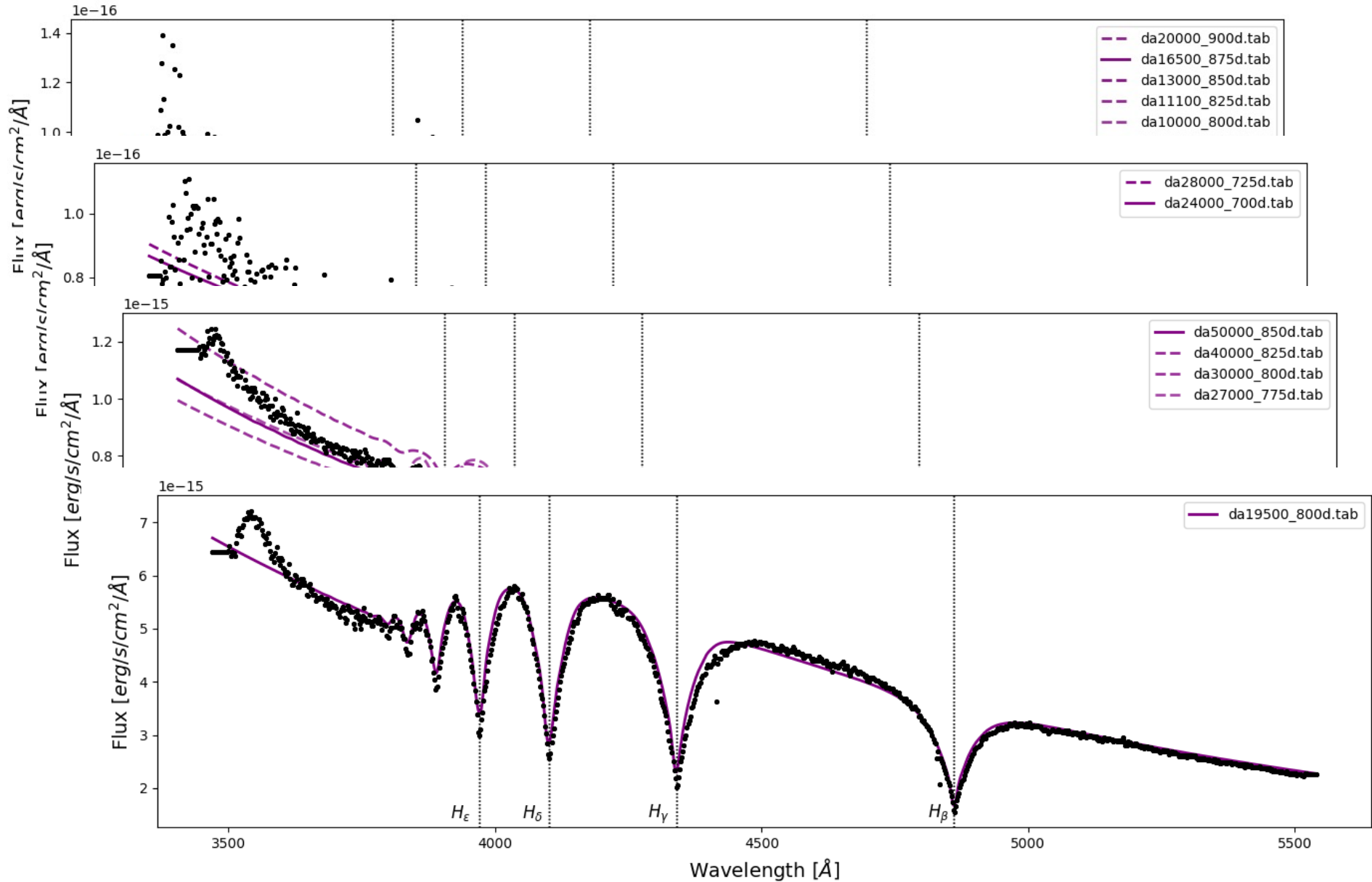
(Castanheira et al. in prep)

# HETDEX UV Calibration



(Gebhardt et al. 2021)

# White Dwarfs in HDR3



# White Dwarfs in HETDEX

- ~ 2000 White Dwarfs
- Magnitude limited sample
- For  $V = 23$ ,  $S/N = 3$
- Additional spectra from parallel mode

# 2024 Total Solar Eclipse

[Eclipse Over Texas Map](#)

[Watching from Waco?](#)

[What Is an Eclipse?](#)

**APRIL 8, 2024**

# 2024 Total Solar Eclipse

The next total solar eclipse in the United States will happen in 2024 and Waco will be the prime location, in the middle of the path of totality. This will be the last total solar eclipse of the century visible in Texas. A total solar eclipse produces a 360° sunset, dark enough to see planets, bright stars, and the Sun's corona and prominences. We look forward to watching the eclipse together!

511 01 40 32

DAYS

HOURS

MINUTES

SECONDS

**EXPLORE** 

