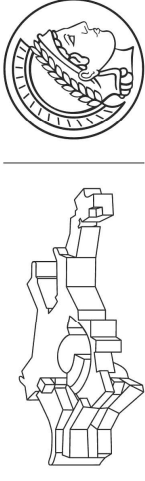


# Investigating supernova feedback in EoR galaxies using Lyman alpha

## Results for massive halos at $z=5$

Elie Cueto  
RECAP online meeting  
May 22<sup>nd</sup> 2026



**MAX PLANCK INSTITUTE**  
FOR ASTROPHYSICS



**Funded by  
the European Union**



**European Research Council**  
Established by the European Commission



# Completed RT for the SPICE simulations

RHD Cosmological simulations for the EoR  
Multiple simulations with different SN feedback modelling

| Bursty Model                                                                                                                                                                                     | Smooth Model                                                                                                                                                                     | Hypernovae Model                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>- Lya RT :</li><li>~ 460 halos + 40 massive halos with lower resolution from Aniket</li><li>- All SN feedback occurs 10 Myr after star formation</li></ul> | <ul style="list-style-type: none"><li>- Lya RT :</li><li>~ 800 halos so far</li><li>- SN feedback occurs ~3-40 Myr after star formation according to stellar lifetimes</li></ul> | <ul style="list-style-type: none"><li>- Lya RT :</li><li>~ 450 halos so far</li><li>- All SN feedback timing like in smooth model, but some stars explode as Hypernovae with more energy</li></ul> |

# Improvements to RASCAS

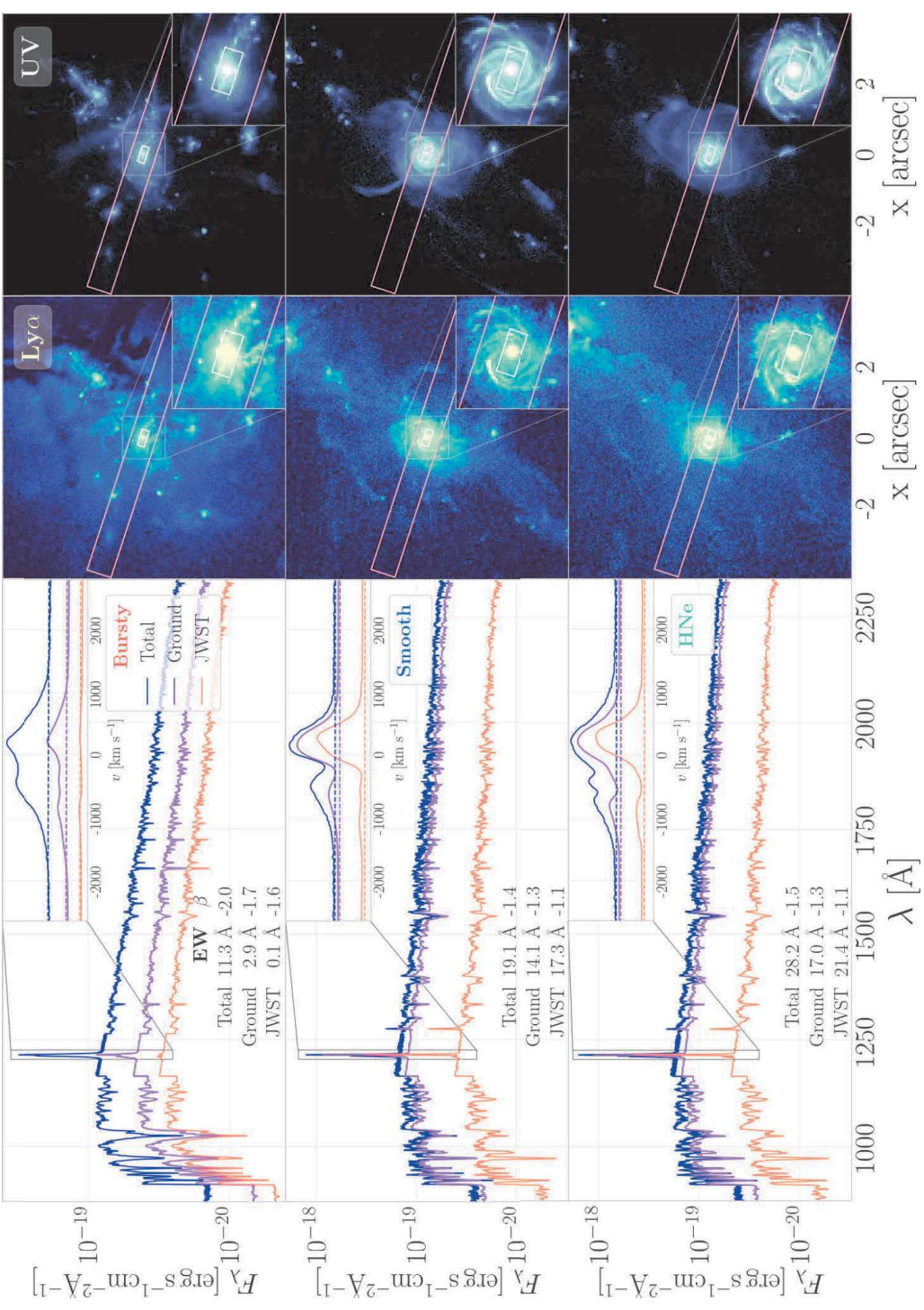
UV continuum with  $10^7$  photons

Now possible in ~10 minutes

Previously ~30 hours

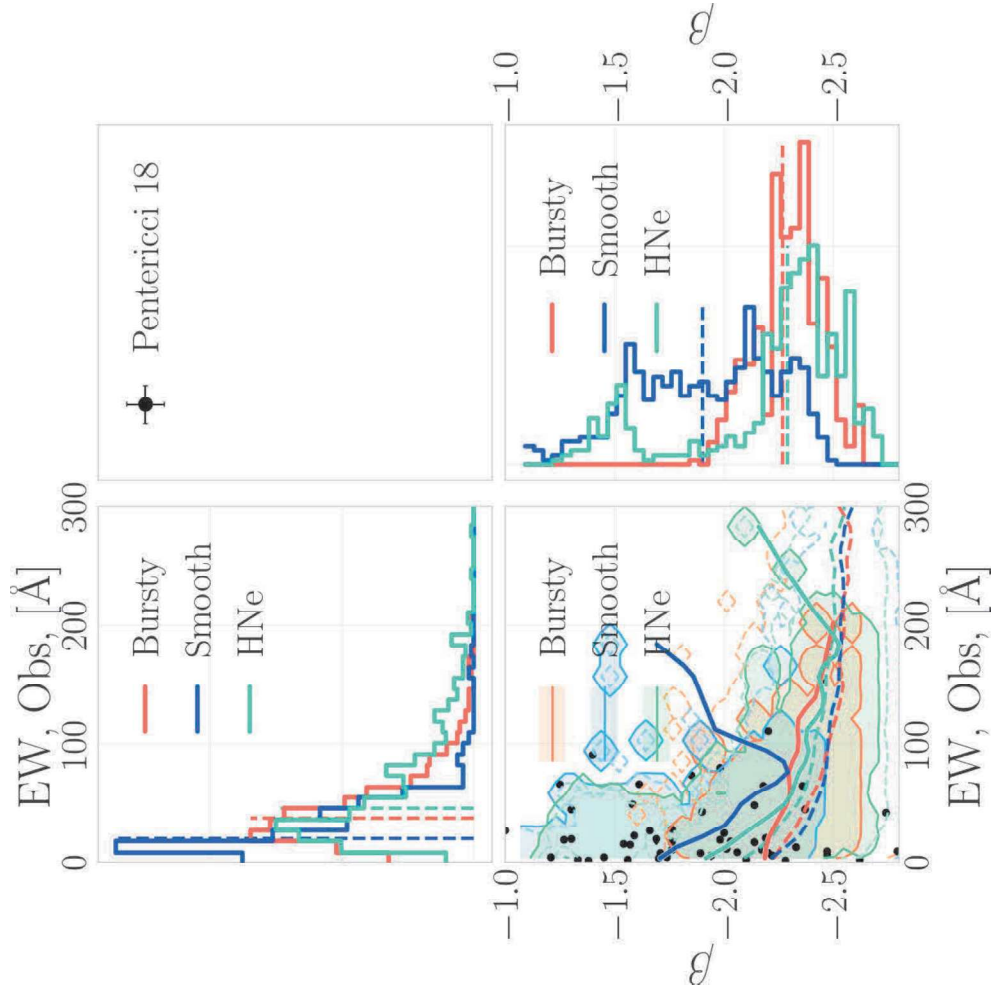
much better convergence of stellar  
continuum possible

# Comparing Models



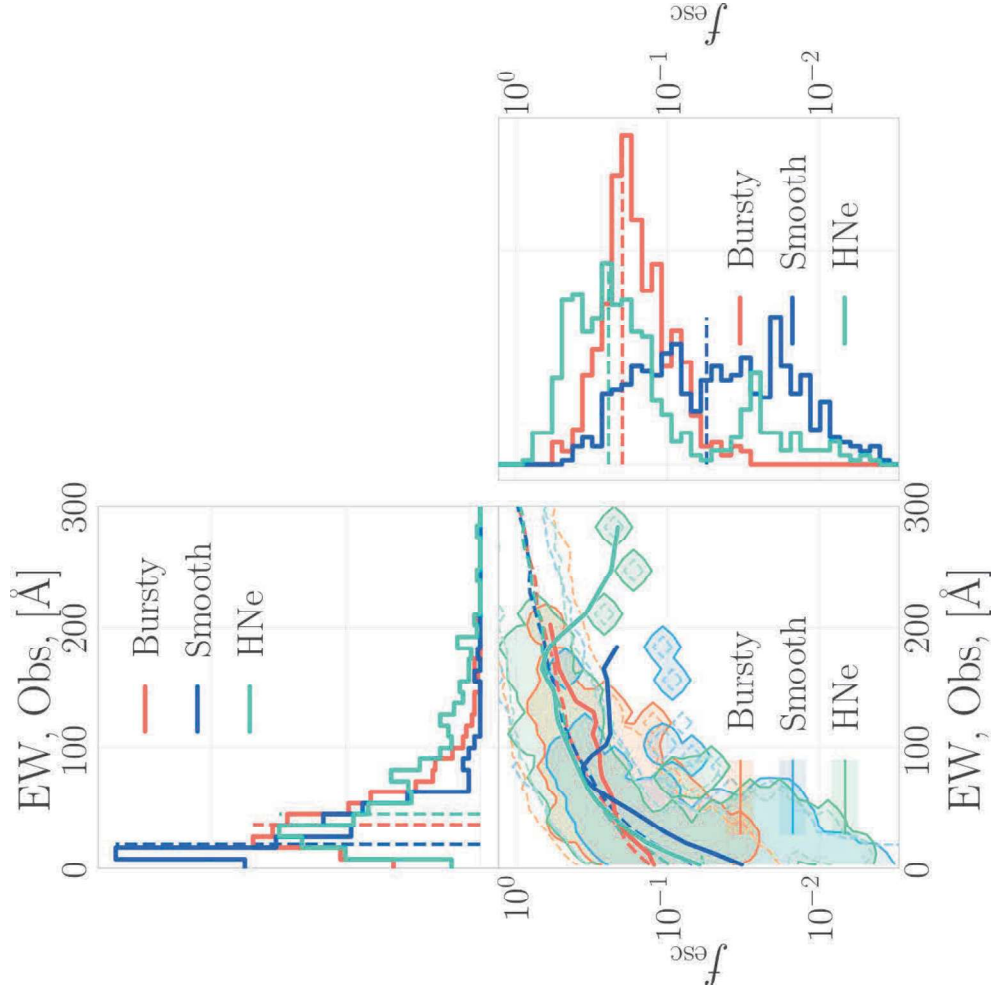
# Comparing Models

Beta / EW



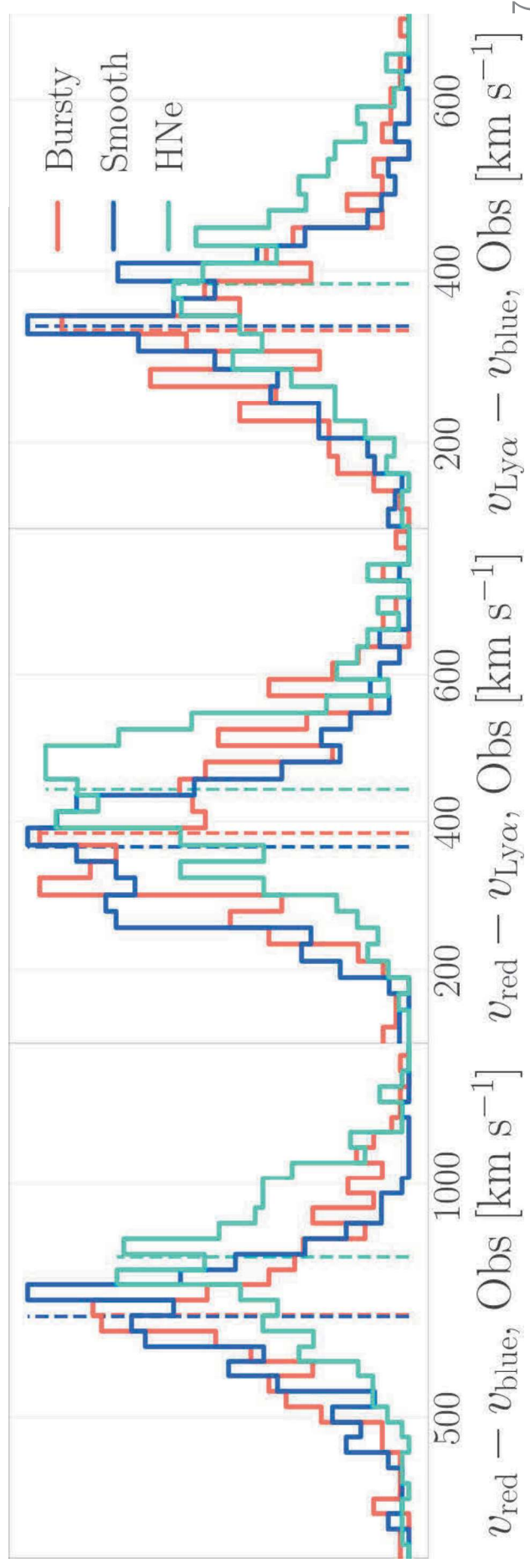
# Comparing Models

$$f_{\text{esc}} / \text{EW}$$



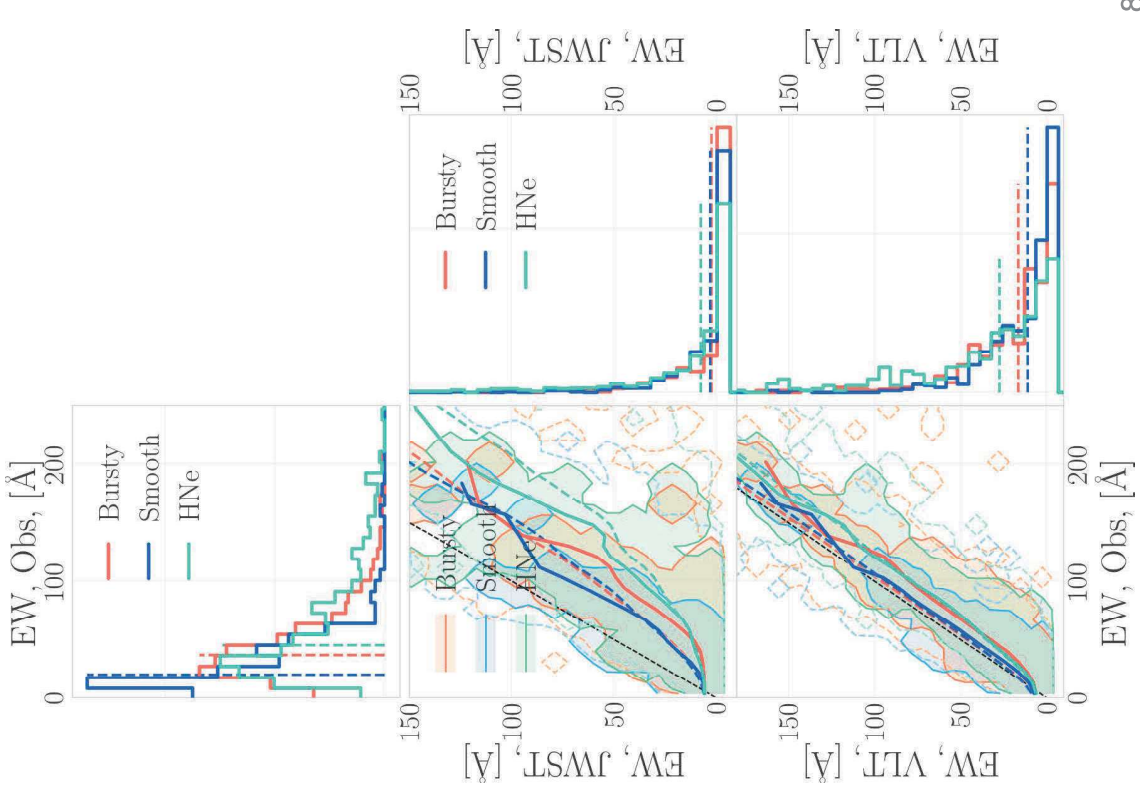
# Comparing Models

Lya peak separation



# Comparing Models

Relative Ly $\alpha$  slit loss



# Lya Absorbtion in BPASS

Absortion feature with  
FWHM~7000km/s

