

The Distribution of Metals in the High Redshift Circumgalactic Medium Around Milky Way Progenitors

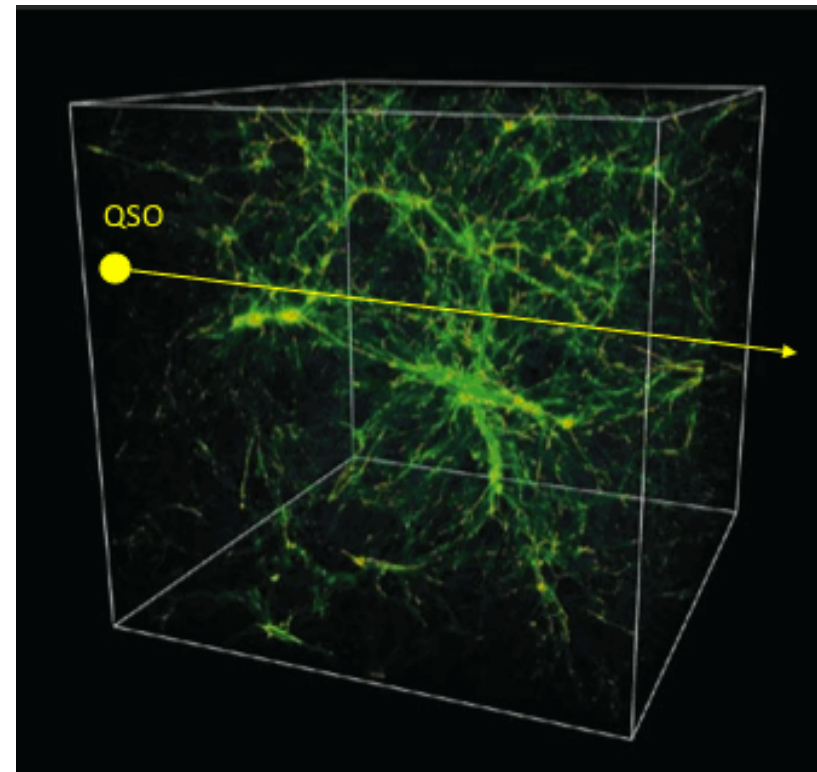
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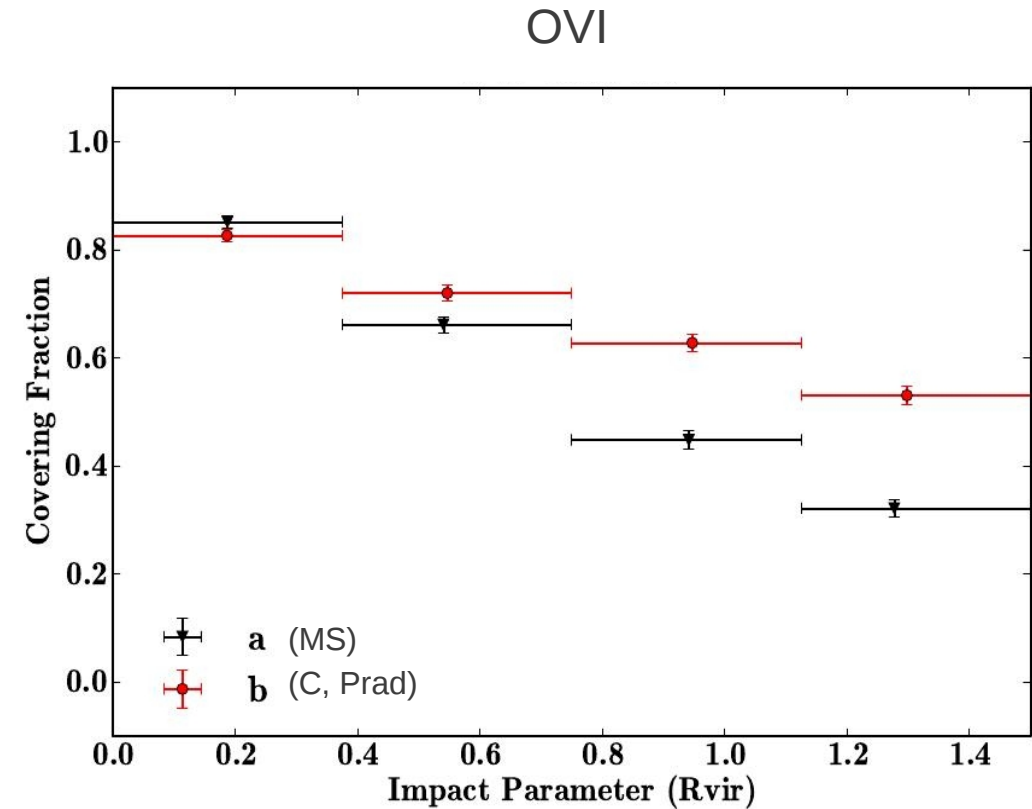
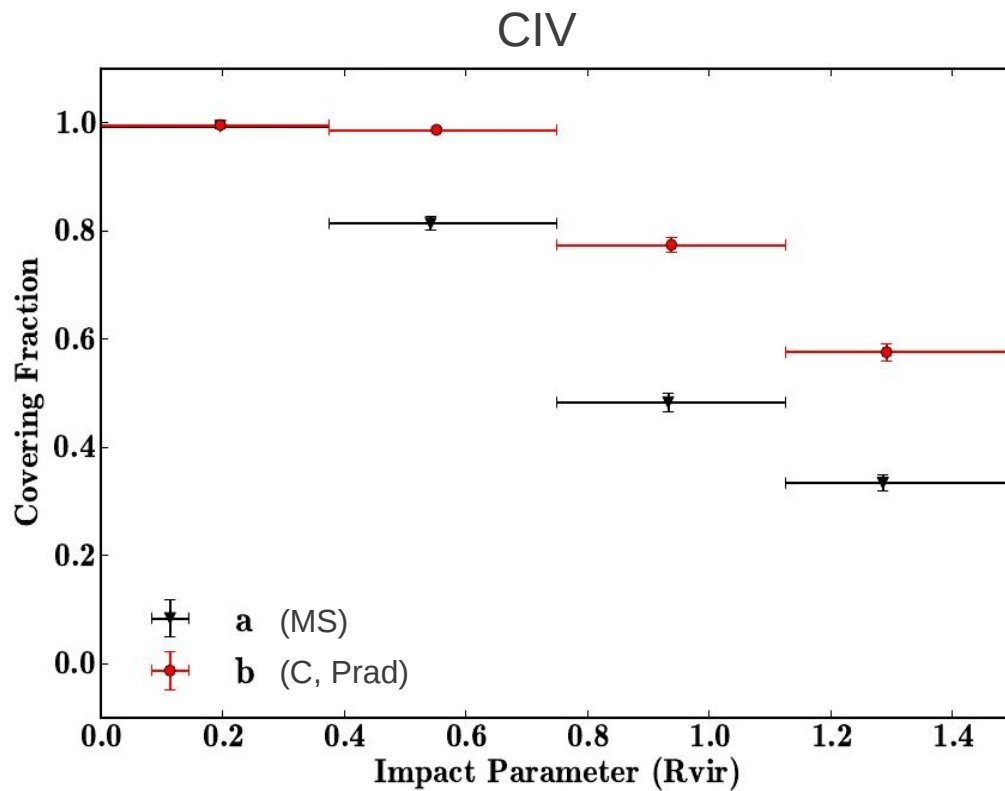
Christopher Churchill; Elizabeth Klimek; Sebastian Trujillo; Daniel Ceverino;
Anatoly Klypin

- **Motivation**
 - CGM plays a major role in galaxy evolution
 - Examining the halos of simulated galaxies is a test of the subgrid physics
- **Methods**
 - Examine the halos of Milky Way progenitors simulated with ART at $z=4$ and $z=2$
 - Each galaxy is simulated twice with differing star formation prescriptions
 - a: Miller-Scalo IMF (MS)
 - b: Chabrier IMF with Radiation Pressure (C, Prad)
 - Generate quasar absorption profiles by running lines of sight through the halos, focusing on CIV and OVI



Covering Fraction vs b / R_{vir}

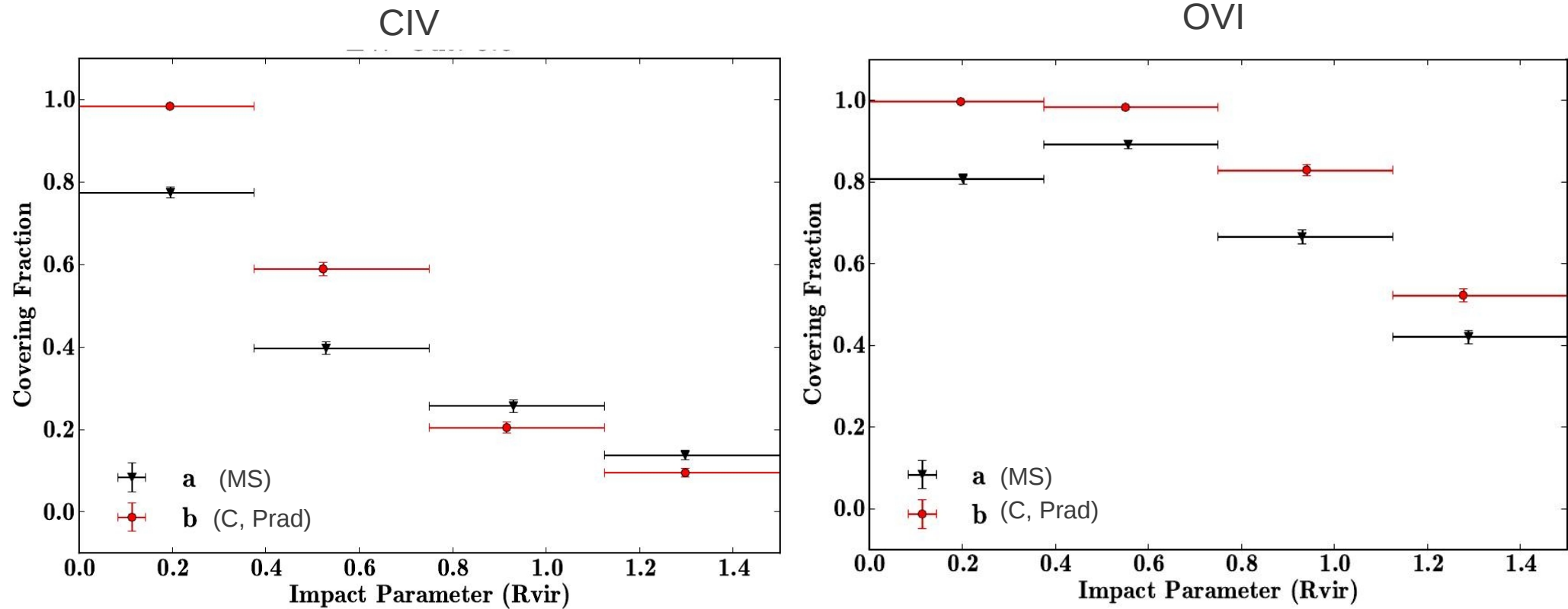
$z=4$



- Larger covering fraction for CIV than OVI
- Simulation b produces a larger covering fraction than simulation a

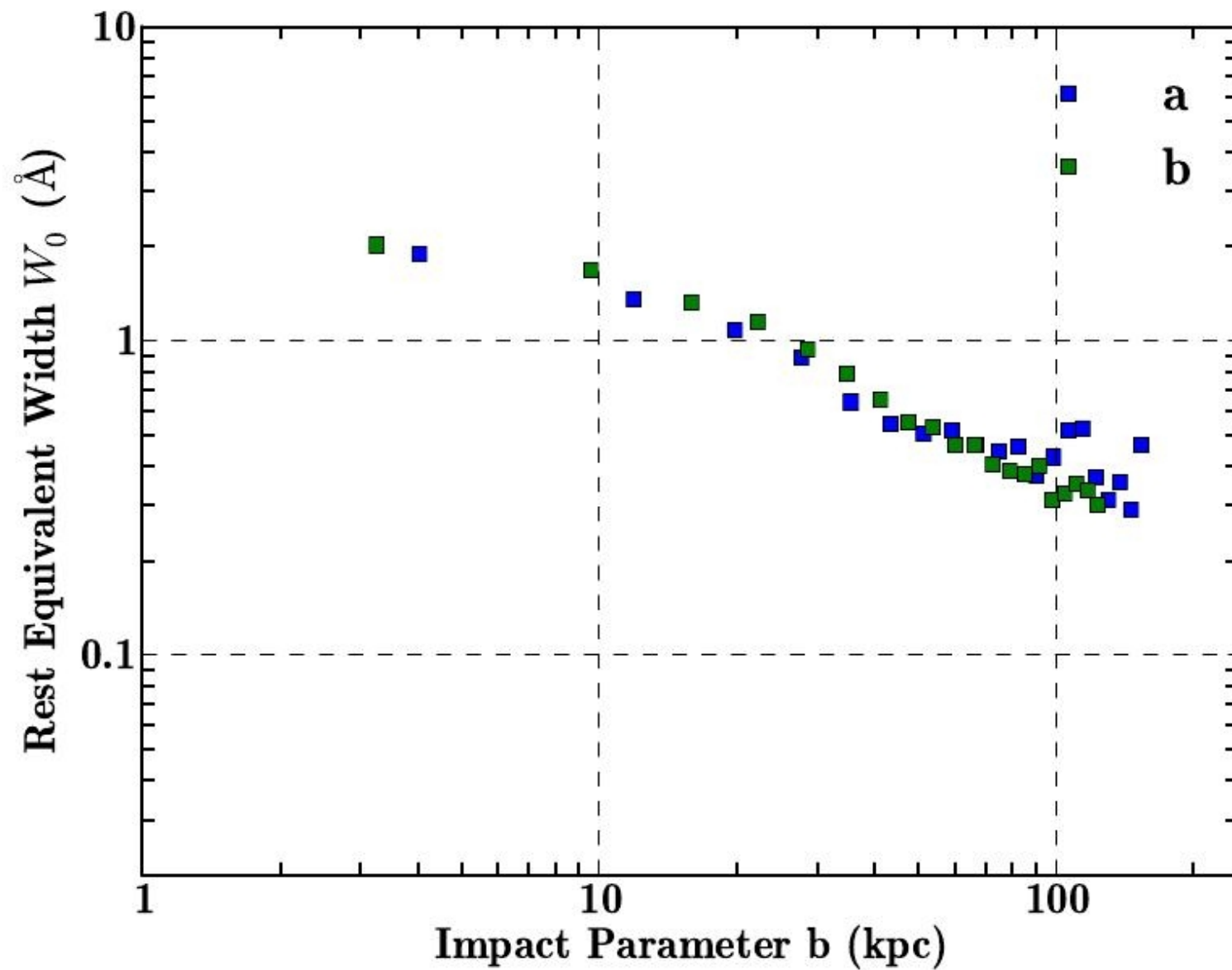
Covering Fraction vs b / R_{vir}

$z=2$

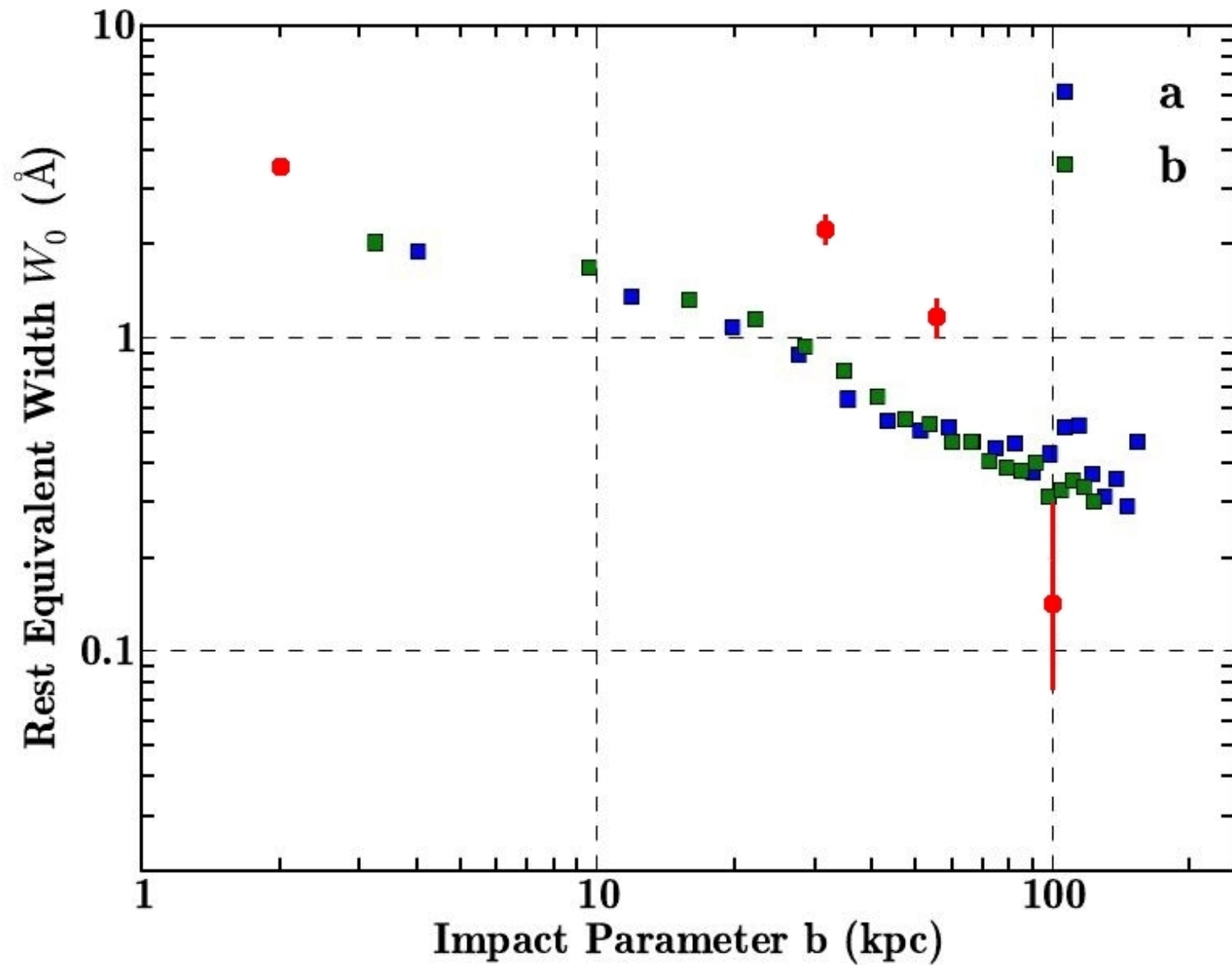


- Larger covering fraction for OVI than CIV
- CIV covering fraction has dropped at all impact parameters while the OVI covering fraction has grown

Mean EW Distribution of CIV at $z=2$



Mean EW Distribution of CIV at $z=2$



Red points from Steidel et al. 2010

Summary

In Milky Way progenitors:

- OVI and CIV halos are in place at $z=4$
 - OVI halo builds up while the CIV halo dissipates between $z=4$ and $z=2$
 - Simulation b creates a larger covering fraction than Simulation a
- EW distribution is not sensitive to the IMF or radiation pressure
 - Mean EW vs. impact parameter is 2x lower than observations
 - Halo is more extended than observed