Contribution ID: **80** Type: **Poster**

Modelling the escape of Lyman Continuum photons from galaxies in the Epoch of Reionization

Wednesday, 17 May 2023 13:15 (1 minute)

We couple the DELPHI framework for galaxy formation with a model for the escape of ionizing photons to study both its variability with galaxy assembly and the resulting key reionization sources. In this model, leakage either occurs through a fully ionized gas distribution (ionization bounded) or additionally through channels cleared of gas by supernova explosions (ionization bounded + holes). The escape fraction is therefore governed by a combination of the density and star formation rate. Having calibrated our star formation efficiencies to match high-redshift observables, we find the central gas density to regulate the boundary between high (>0.70) and low (<0.06) escape fractions. As galaxies become denser at higher redshifts, this boundary shifts from Mh~10^9.5Msol at z~5 to Mh~10^7.8Msol at z~15. While leakage is entirely governed through holes above this mass range, it is not affecting general trends for lower masses. We find the co-evolution of galaxy assembly and the degree of leakage to be mass and redshift dependent, driven by an increasing fraction of fesc<0.06 galaxies at increasing mass and redshift. The variability in the escape of ionizing photons is driven by the underlying variations in our dark matter assembly histories. Galaxies with Mh<10^7.9 (10^8.9)Msol provide half of the escaping ionizing emissivity by z~10(5) in the ionization bounded model. On the other hand, galaxies that purely leak through holes contribute 6 (13)% at z~5(15). Reionization ends slightly (~50Myr) earlier in the ionization bounded + holes model, leaving the overall shape of the reionization history unaffected.

Primary author: BREMER, Jonas (Kapteyn Institute)

Co-author: DAYAL, Pratika (Kapteyn Institute, Groningen University)

Presenter: BREMER, Jonas (Kapteyn Institute)

Session Classification: Poster Prizes & closing