



Contribution ID : 391

Type : Poster

Constraints on IGM Neutral Fraction at $z = 9.02-14.18$ Using Ly- α Measurements

Tuesday, 27 October 2026 19:25 (5)

In this work, we focused on the conditions at the Cosmic Dawn, before cosmic reionisation. We place new constraints on the fraction of the neutral hydrogen of the intergalactic medium at $z = 9.02-14.18$, after analysing Lyman-alpha emission (including upper limits) from 94 galaxy sources. Of these sources, there were 91 3σ upper limits and 3 detections. This analysis was done using JWST data for both PRISM and grating measurements, and incorporated both spectrometric and photometric measurements. New spectra from sources such as JADES Goods-North are included, while one anomalous detection from JADES Goods-South was excluded since it exhibited an abnormally high equivalent width (EW). We updated the IGM neutral fraction (x_{HI}) to be $0.889 (+0.073 / -0.084)$. Furthermore, from our model, we found a significant distinction between x_{HI} when variable ionised bubble size was considered versus a fixed bubble size.

Primary author(s) : LYU, Qianli (University of Oxford)

Presenter(s) : LYU, Qianli (University of Oxford)

Session Classification : Poster session

Track Classification : Gravitation and cosmology