Preparing for JWST to unveil the sources of cosmic reionization: Testing Mg II as LyC tracer in confirmed LyC leakers and non-leakers

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Understanding if and how galaxies contributed to reionize the universe constitutes one of the three principal science goals of the James Webb space telescope (JWST). During the epoch of reionization (EoR), the neutral IGM renders direct LyC detections very unlikely and thus difficult to measure, justifying the need for indirect LyC tracers. Several indirect methods have been proposed and tested on low-z galaxies emitting LyC photons. We now urgently need to validate and calibrate these methods as JWST is observing galaxies in the EoR. The Low-redshift Lyman Continuum (LzLCS) is the largest sample of local galaxies with Hubble Space Telescope LyC observations. We carried out integral field spectroscopy follow-up observations of 21 confirmed LyC leakers and non-leakers from this sample in order to test one of the most promising indicators of ionizing photon escape: the Mg II emission. Our HET/LRS2 and Keck/KCWI observations allow spatially resolved analysis from the Mg II emission lines to the H-alpha emission line. Our galaxies span a wide range of LyC escape fraction (from no escape to 90%) which enabled us to test whether MgII traces the escape of ionizing photons. In this talk I will present our MgII maps — which unveil the hydrogen neutral gas geometry around these LyC leakers — and the comparison to other non-resonant line maps, like [OII] and Halpha. I will finally show some preliminary results of our JWST cycle 1 program (1871) reporting the detection of Mg II in a z~7 galaxy, and discuss the implications of our low-z study for JWST to use MgII as a tracer of the LyC escape at the EoR.