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The Green Peas: Searching for LyC Emitters at Low Redshift

Anne Jaskot[1] **and Sally Oey**[2]

[1]Dept. of Astronomy, Smith College, Northampton, MA 01063, USA
email: ajaskot@smith.edu

[2]Dept. of Astronomy, University of Michigan, Ann Arbor, MI 48109, USA

Abstract. The escape fraction of Lyman continuum (LyC) radiation from galaxies remains one of the primary uncertainties in studies of reionization. However, few LyC-emitting galaxies are known. The recently identified, low-redshift "Green Pea" (GP) galaxies exhibit a number of similarities with high-redshift galaxies, and their optical emission lines suggest they may be some of the elusive LyC emitters. Recent *HST* COS and ACS observations of four GPs suggest further evidence for LyC escape and give new insights into the origins of Lyα and low-ionization UV lines in high-redshift galaxies. The Lyα emission and low-ionization emission and absorption lines provide a coherent physical picture of the neutral gas distribution in the GPs and may identify LyC emitters at high redshift. The rare, low-redshift GPs hint at possible factors that may enable LyC and Lyα escape from high-redshift galaxies.

Keywords. galaxies: evolution, galaxies: general, galaxies: high-redshift, galaxies: intergalactic medium, galaxies: ISM, galaxies: starburst, radiative transfer, ultraviolet: galaxies

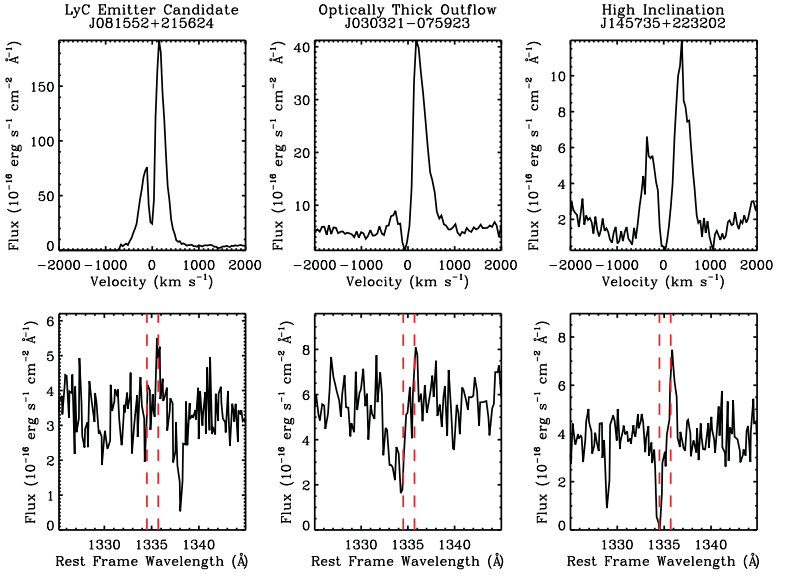

Figure 1. Top: Lyα emission from three Green Peas with different inferred optical depths and geometries. **Bottom:** The red lines show the expected positions of [C II] λ1334.5 absorption and [C II]* λ1335.7 emission. The LyC emitter candidates have strong, narrow Lyα, indicative of minimal scattering in neutral gas. They show scattered [C II]* emission but no line-of-sight [C II] absorption. The galaxy with an inferred optically thick outflow has deep, blue-shifted absorption and weaker, redshifted Lyα emission. The final Green Pea shows weak Lyα within an absorption trough and strong low-ionization absorption and emission from a high column density ISM.